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DISEASES CAUSED BY BACTERIA AND FUNGI

DERBYSHIRE, J. B. (1958). **The pathology of experimental staphylococcal mastitis in the goat.**—*J. comp. Path.* **68,** 449-454. [Author's conclusions modified.] **913**

Udder sections were examined from 13 goats inoculated with living staphylococci into the teat canal, and from 8 goats inoculated with control substances, at intervals after inoculation. The control substances produced a transient non-specific reaction similar to the histological changes in mild, non-gangrenous mastitis produced by living staphylococci.

In gangrenous mastitis there was widespread, rapid necrosis of the mammary tissue associated with thrombosis of the veins draining the inoculated side of the udder. In severe, non-gangrenous mastitis lobular changes consisted of degeneration of the epithelial cells of many alveoli and an interstitial inflammatory reaction leading to extensive fibrosis with involution of the secretory alveoli. Abscess formation frequently occurred. Large ducts showed epithelial stratification and smaller ducts ingrowths of granulation tissue.

The pathology of this experimental staphylococcal mastitis resembled the natural bovine disease as reported in the literature.

ABEL, R. & PINOCHET, L. (1958). Sensibilité aux antibiotiques *in vitro* des souches de *Staphylococcus aureus* qui sont la cause de mammites bovines. **[Sensitivity to antibiotics of strains of *Staph. aureus* from bovine mastitis.]** — *Absts. of Proc. VIIth Int. Congr. Microbiol., Stockholm* p. 329. [In French.] **914**

Strains were tested for sensitivity to 8 antibiotics with the result that 94% were sensitive to penicillin, 89% to streptomycin, 89% to chlortetracycline, 97% to oxytetracycline, 95% to tetracycline, 97% to chloramphenicol, 100% to erythromycin and 91% to bacitracin.—R.M.

MÅNSSON, I. (1958). Antibiotikaterapi—några synpunkter. **[Antibiotic therapy—problem of antibiotic resistance.]** — *Medlemsbl. Sverig. VetFörb.* **10,** 406-407. [In Swedish.] **915**

Antibiotic resistance tests on 150 strains of staphylococci isolated from clinical cases in which antibiotic therapy was ineffectual, showed 60% resistant to oxytetracycline; 58% to chlortetracycline; 45% to streptomycin; 37% to penicillin; 25% to chloramphenicol; 22% to tetracycline; 15% to erythromycin; 35% were resistant to sulphanilamide (included for comparison). Details are to be published later.

—F.E.W.

DAS, M. S. (1958). **Isolation of penicillin resistant strains of *Staphylococcus* and *Streptococcus* from cases of bovine mastitis in India.** —*Indian vet. J.* **35,** 337-342. **916**

D. tested *in vitro* 16 strains of streptococci (including 12 β-haemolytic) and 22 strains of coagulase-positive staphylococci isolated from two herds. Four of the streptococci (including 2 β-haemolytic) and 2 of the staphylococci were highly resistant to penicillin.

—R. N. MOHAN.

SCHALM, O. W., NOORLANDER, D. O. & PIER, A. C. (1958). **Mechanical milking and mastitis.**—*Proc. 61st Ann. Meet. U.S. live Stk sanit. Ass., St. Louis,* 1957. pp. 187-196. **917**

A discussion on the advantages of narrow-bore stretched teat cup liners and teat cup design, similar to that abstracted previously [*V.B.* **28,** 3820].—R.M.

MURPHY, J. M. (1958). **The invading organisms and the host in bovine mastitis.**—*Proc. 61st Ann. Meet. U.S. live Stk sanit. Ass., St. Louis,* 1957. pp. 175-182. **918**

M. discussed factors affecting the entry of mastitis organisms into the udder, with reference to work done at New York State Veterinary College [see also *V.B.* **25,** 8, 267, 562, 1249 & 1853].—R.M.

RENK, W. & TEUTE, H. W. (1958). Untersuchungsergebnisse über den Eiweissgehalt der Milch von Kühen mit und ohne Mastitiden. **[Protein content of milk from healthy cows and cows with mastitis.]** — *Berl. Münch. tierärztl. Wschr.* **71,** 23-26. [Summary in English.] **919**

192 samples of milk from normal cows and from cows with different degrees of mastitis were submitted to the biuret reaction. Mastitis milk had a lower content of total proteins, casein and albumin than normal milk but a higher globulin content. The albumin-globulin ratio was highest in normal milk and lowest in milk from cows with acute mastitis.—M.G.G.

VAN DORSSEN, C. A. (1958). **On the aetiology of strangles.**—*Tijdschr. Diergeneesk.* **83,** 852-860. [In English. Summaries in Dutch, French and German.] **920**

The author disagreed with the suggestion made by Manninger & Mócsy (1954) on p. 493 of the tenth edition of their textbook [*V.B.* **26,** 671] that a virus was involved in the aetiology of strangles. There was no reason for believing that the primary cause was not *Str. equi*.—R.M.

SCHWAB, J. H., CROMARTIE, W. J. & ROBERSON, B. S. (1959). **Identification of a toxic cellular component of Group A streptococci as a complex of group-specific C polysaccharide and a protein.**—*J. exp. Med.* **109,** 43-54. [Authors' summary modified.] **921**

The toxic cellular component of Group A streptococci, which produces a chronic multinodular lesion of the dermal connective tissue of rabbits, was isolated by differential centrifugation and electrophoresis. It appeared to be a macromolecular complex of polysaccharide and protein, the polysaccharide having the serological and chemical characteristics of the group-specific C substance. Evidence is presented that the polysaccharide moiety is an essential part of the toxic complex. Further studies of this material might help to elucidate the mechanism of tissue damage in the non-suppurative sequelae of Group A streptococcal infections.

JOHNSON, B. H. & FURRER, W. (1958). **Hyaluronic acid: a required component of beta hemolytic streptococci for infecting mice by aerosol.**—*J. infect. Dis.* **103,** 135-141. [Authors' summary modified.] **922**

Of 14 streptococcal strains all those that formed large amounts of hyaluronic acid in broth cultures exhibited similar infectivity for normal mice and mice weakened by exposure to influenza virus or radiation. All the mice were exposed to a standard dose of streptococcal aerosol. Conversely, strains producing little hyaluronic acid were not infective for normal mice although they were for the weakened mice.

POPOVIĆ-SABO, M. (1958). Biohemiski prilozi poznavanju mehanizma delovanja B. anthracisa. **[Biochemical study of the action of *Bacillus anthracis*.]**—*Veterinaria, Sarajevo* **7,** 335-340. [In Croat. Summary in English.] **923**

Calcium, potassium, magnesium, phosphorus, glucose, cholesterol and protein values were studied in 15 sheep, s/c infected with 0·1 ml. of an 18 hour broth culture of virulent *B. anthracis*. Blood samples were examined both before and 6-hourly after infection, until death. The calcium values decreased and the potassium values increased. Magnesium and phosphorus values varied, but shortly before death they were slightly raised. Glucose values increased during the first 30 hours, but then fell rapidly.—E.G.

KRISHNA RAO, N. S. & MOHIYUDEEN, S. (1958). **Tabanus flies as transmitters of anthrax — a field experience.**—*Indian vet. J.* **35,** 348-353. **924**

Tabanid flies were believed to be responsible for spreading a "cutaneous" form of anthrax among cattle and malignant pustule in human beings. The organism was demonstrated microscopically in 3 of 4 flies caught while feeding over the affected area on a buffalo.
—R. N. MOHAN.

I. LAMB, R. (1958). **Occupational hazards in the bone-meal industry.**—*Lancet* July 19th, 151-153. **925**

II. GREEN, D. M. & JAMIESON, W. M. (1958). **Anthrax and bone-meal fertiliser.**—*Ibid.* 153-154. **926**

I. Frequent sampling of bones and bone dust over 5 years in a factory processing bones imported from India, Pakistan and Argentina revealed spores of *Bacillus anthracis*. Four cases of cutaneous anthrax and two of clostridial empyema in employees are described. The two with empyema worked at the crushing mill and were exposed to heavy concentrations of dust. *Clostridium tertium* was isolated from one.

II. Three cases of anthrax are described in labourers that had handled bone-meal fertilizers. *B. anthracis* was isolated from samples of bone fibre handled by one of them; the source of the fibre was India or Argentina, or possibly both. An addendum reports a further case in a seedsman; *B. anthracis* was isolated from bone meal used by him.—M.G.G.

I. Kolesov, S. G. (1957). **[Methods of obtaining anthrax vaccine.]**—*Trud. nauchno-kontrol. Inst. vet. Preparatov* **7,** 177-193. [In Russian.] **927**

II. Kolesov, S. G., Mikhailov, N. A. & Borisovich, Y. F. (1957). **[Method of preparing aluminium hydroxide vaccine against anthrax and the results of field trials.]**—*Ibid.* 194-200. [In Russian.] **928**

I. Strain Sh-15 was best of several attenuated strains of anthrax bacillus suitable for vaccine production. The strain retained its morphological, pathogenic and immunogenic properties after storage in glycerol or in a dry state under vacuum. Trials with aluminium hydroxide vaccine prepared from this strain have already been described [*V.B.* **28,** 1307]. A g.pig test for control of the vaccine was described.

II. Most g.pigs survived s/c inoculation with 40 million spores of Strain Sh-15, and rabbits resisted s/c inoculation with 120–150 million spores. Between 2 and 4 out of every 10 mice inoculated with 2–3 million spores died after 3–7 days. Preparation of aluminium hydroxide spore vaccine is described. Between 1954 and January 1956, 2·7 million farm animals were vaccinated. Complications from vaccination were rare. 10 deaths among 666,000 vaccinated cattle and 136 deaths among 1·3 million sheep were attributed to vaccination. It was stated that losses [? from anthrax] in 1954 and 1955 amounted to 9 cattle (0·0011%), 1 horse (0·00078%), 141 sheep (0·008%) and 15 goats (0·048%).—R.M.

Anon. (1958). **Report of committee on tuberculosis.**—*Proc. 61st Ann. Meet. U.S. live Stk sanit. Ass., St. Louis,* 1957. pp. 215-216. **929**

It was stated that the percentage of cattle reacting to tuberculin in the U.S.A. during 1957 was higher than for any similar period since 1950. One of the difficulties in controlling the disease was inadequate identification of cattle, making it difficult to trace the source of infected cattle detected at slaughter.—R.M.

Paterson, A. B. (1958). Aptitude du bétail indemne de tuberculose à réagir aux tuberculines aviaire et bovine. Etude des facteurs d'environnement, locaux et géographiques. **[Reaction to avian and bovine tuberculins in cattle free from tuberculosis.]**—*Bull. Off. int. Epiz.* **50,** May. pp. 290-304. [English summary.] **930**

Evidence is presented that although the degree of non-specific reactivity to mammalian tuberculin is similar in Cumberland and Berkshire, the method of its production differs in the two areas. Cumberland shows a pronounced effect of altitude and region on tuberculin reactivity but unlike Berkshire, no suggestion of an influence of woodland wild life.

The two counties exhibit a similar picture in incidence and level of reaction of animals with skin tuberculosis, in distribution of reactions to both tuberculins, in the reactivity of bulls and steers, and in showing no marked influence of breed.

Tunkl, B., Foršek, Z. & Romić, Z. (1958). Testiranje bovinog tuberkulina na umjetno senzibiliziranim govedima. II. Narav lezija nastalih aplikacijom antigena i njihov utjecaj na organizam senzibiliziranih goveda. **[Evaluation of bovine tuberculin in sensitized cattle. II. Nature of lesions caused by antigens and their influence on cattle.]**—*Veterinaria, Sarajevo* **7,** 247-256. [In Croat. Summary in English.] **931**

Cattle sensitized with a suspension in liquid paraffin of killed *Mycobact. tuberculosis* were used for the evaluation of tuberculin. There is no maternal transfer of sensitivity, nor is there a direct relationship between the haemagglutination titre and the intensity of the allergic reaction, but there was a direct relationship between the haemagglutination titre and the antigen used.—E.G.

Kuslys, A. (1958). Humane Tuberkulosereinfektion in einem total sanierten Bestande. **[Tuberculosis of human origin in a TB.-free herd.]**—*Schweiz. Arch. Tierheilk.* **100,** 278-281. [Summaries in English, French and Italian.] **932**

Human type tubercle bacilli were isolated P.M. from material from a bull from a herd which had been free from tuberculosis for two years. The infection was thought to have been from a farm labourer. [See also *V.B.* **28,** 2719]. —E.G.

Uçar, N. (1958). İnsan vereminde sığir tüberkülozunun rolü ve tip tayini üzerinde memleketimizdeki araştirmalar. **[Incidence of bovine tuberculosis in man and cattle in Turkey.]**—*Ask. vet. Derg.* **36,** No. 208. pp. 11-18. [In Turkish. Abst. from German summary.] **933**

In Turkey 6·6% of TB. in human beings is caused by bovine type bacilli. Nearly 5% of all slaughtered cattle were infected. The necessity for an efficient eradication programme was stressed. Since the number of civilian

veterinarians is inadequate, it was suggested that army veterinarians should participate in the control programme.—E.G.

ROMIĆ, S. (1958). Iskorišćavanje hrane u tovu tuberkuloznih krava. **[Food utilization in tuberculous cows.]**—*Veterinaria, Sarajevo* **7,** 81-86. [In Croat. Summary in English.] **934**

In a food utilization experiment involving 49 healthy cows, 56 tuberculin reactors without visible lesions and 59 cows with active TB. of either udder, lungs, uterus, bones, kidneys, bladder or intestine, the tuberculous cattle were poor utilizers of food.—E.G.

HUBRIG, T. & KRÜGER, W. (1958). Untersuchungen zur Tuberkuloseschutzimpfung bei Rindern. **[Immunization of cattle against tuberculosis.]**—*Mh. VetMed.* **13,** 513-519. **935**

Of 39 cattle free from TB., 24 were vaccinated s/c with two doses each of 100 mg. B.C.G. concentrated vaccine 106 days apart, and 15 served as controls. They were placed in contact with tuberculous cattle from 46 to 226 days after the second vaccination. P.M. examination at intervals between 4 and 53 months after vaccination revealed no protection against TB. in the cattle given B.C.G.—M.G.G.

CASATI, R. (1958). Osservazioni su di un caso di tubercolosi del cammello. **[Tuberculosis in a camel.]**—*Atti Soc. ital. Sci. vet., Rimini-Ravenna* 1957. **11,** pp. 551-554. [Summaries in English and French.] **936**

Generalized TB. was diagnosed P.M. in a camel. The primary site was in the respiratory tract and secondary lesions were found in the liver and kidneys. Miliary lesions (recent and old), tubercles and nodules in various stages were present in these sites and the associated lymph nodes. Tuberculous pleurisy, with typical grape formation, was also present. It is considered that infection was by inhalation and generalization occurred by the lymphatic system and blood stream. A peculiar feature was the absence of giant cells from lesions. This is in agreement with Curasson's observations. Biological tests demonstrated active bacteraemia. The responsible organism was of the bovine type.—T.E.G.R.

I. SCHLIESSER, T. & KASTNER, H. J. (1958). Zur Frage der Verbreitung und Bedeutung der Ziegentuberkulose. **[Tuberculosis in goats.]** — *Rindertuberkulose u. Brucellose* **7,** 121-127. **937**

II KASTNER, H. J. (1958). Untersuchungen über die Verbreitung und Bedeutung der Ziegentuberkulose in einem Praxisgebiet des Schwarzwaldes. **[Tuberculosis in goats in the Black Forest.]** — *Inaug. Diss. Munich* pp. 28. **938**

I. & II. Of 227 goats housed with cattle in the Black Forest 24 were positive to tuberculin tests with bovine tuberculin; 21 of these were in severely infected cattle herds, one was in a mildly infected herd, and 2 were in herds in which the cattle were free from TB. Eight were slaughtered; bovine tubercle bacilli were demonstrated in 7 and avian in one. Of 33 milk samples from positive goats without clinical TB. of the udder, one yielded bovine tubercle bacilli.

—M.G.G.

BERG, O. A. (1958). **Tuberculin reactions in dogs.**—*Acta tuberc. scand.* Suppl. No. 43, pp. 48. [In English.] **939**

B. described tests on dogs performed during 7 years at the Veterinary College of Norway. Intradermal tests with Old Tuberculin were unreliable. I/d tests with 500-5,000 i.u. of heat-concentrated synthetic medium tuberculin gave reliable and significant results in experimentally infected dogs, but even this test was sometimes negative in emaciated cases of TB. While non-specific reactions culminated after 24 hours, specific reactions seldom reached a maximum until 48 hours after injection. An increase in skin thickness by 2 mm. with 500 i.u. of tuberculin or 3 mm. with 5,000 i.u. was regarded as a positive reaction.—R.M.

LYON, R. H., LICHSTEIN, H. C. & HALL, W. H. (1958). **Influence of age on metabolic activity of *Mycobacterium tuberculosis*.** — *Proc. Soc. exp. Biol., N.Y.* **99,** 79-81. [Authors' summary modified.] **940**

Lactate oxidation by washed cells of *M. tuberculosis* Strain H37Ra was influenced by age of the cells, those obtained during the log. phase of growth being most active metabolically.

GIRARD, G. & GRUMBACH, F. (1958). L'infection tuberculeuse de la souris entraîne sa résistance à l'infection pesteuse expérimentale. **[Resistance of tuberculous mice to pasteurella infection.]**—*C. R. Soc. Biol., Paris* **152,** 280-282. **941**

Tuberculous mice showed resistance to s/c infection with *Past. pestis*. The more advanced the TB., the greater was their resistance. Resistance was complete in mice with lung lesions. The TB. followed its normal fatal course, being unaffected by the *Past. pestis* infection. Increased activity of the reticulo-endothelial system is discussed as a possible explanation.

—M.G.G.

SUTER, E., ULLMAN, G. E. & HOFFMAN, R. G. (1958). **Sensitivity of mice to endotoxin after vaccination with BCG** (*Bacillus Calmette-Guérin*). — *Proc. Soc. exp. Biol., N.Y.* **99,** 167-169. **942**

Mice given a single i/v inj. of B.C.G. became hypersensitive to bacterial endotoxin after about 5 days: the LD_{50} for *E. coli* lipopolysaccharide was 6–7 μg., as compared with 357μg. in controls. This hypersensitivity lasted for at least 70 days. Single or repeated inj. of trehalose dimycolate ("cord factor" from virulent tubercle bacilli) induced a similar state of hypersensitivity to endotoxin.—F.E.W.

SCHELS, H. (1958). Desinfektionsversuche an Mycobacterium avium mit dem Präparat Sigambol A. **[Disinfectant action on avian type tubercle bacilli of "Sigambol A".]**— *Inaug. Diss., Munich* pp. 41. **943**

"Sigambol A", a mixture of glycols, was tested on 9 strains of avian type tubercle bacilli and on faeces from tuberculous fowls. The resistance of the 9 strains varied widely, old laboratory strains being of low resistance and recently isolated strains of high resistance. Against strains of low and medium resistance "Sigambol A" diluted in 7 parts of water was as effective as 3% formol, but against strains of high resistance a conc. of 1 part "Sigambol A" in 4 parts of water was necessary. "Sigambol A" did not kill tubercle bacilli in moist faeces but did so in dry faeces. It is concluded that "Sigambol A", diluted in 8 parts of water, is suitable for disinfecting fowl-houses from avian TB., provided that large quantities are used and that the houses are completely dry. [See also *V.B.* **26,** 705.]—M.G.G.

PURDOM, M. R., SEAMAN, A. & WOODBINE, M. (1958). **The bacteriology and antibiotic sensitivity of** *Corynebacterium pyogenes*.—*Vet. Rev. Annot.* **4,** 55-91. **944**

A review of the bacteriology of *C. pyogenes* and its occurrence in animals and man, mode of transmission, and chemotherapy.—R.M.

COLLIER, H. O. J. & GRIMSHAW, J. J. (1958). **Local action of some antibacterial substances against** *Corynebacterium ovis* **in guinea-pig skin.** — *Brit. J. Pharmacol.* **13,** 231-237. [Authors' abst. modified.] **945**

When *C. ovis* was injected i/d into g.pigs, a roughly circular lesion developed within 24 hours. Lesions of smaller diameter arose if benzylpenicillin, dequalinium, hedaquinium, cetrimide, or oxytetracycline were injected at the identical site, either before, with, or after *C. ovis*. Such reductions of lesion diameter are due to direct action of drugs on bacteria and not to antitoxic or anti-inflammatory actions. Lesion diameters became less as drug dosage increased up to a limit, and these reductions provided a measure of local antibacterial action *in vivo*. I/d inj. of higher concentrations of antibacterial substances, without *C. ovis*, produced comparable but somewhat flatter lesions, diameters of which increased with increasing conc. of drug and provided a measure of intradermal toxicity.

DHANDA, M. R., GANGULEE, P. C. & BENERJI, T. P. (1958). **Effect of sulphonamides in experimental glanders.** — *Indian vet. J.* **35,** 342-345. **946**

Sulphathiazole, sulphadimidine and sulphadiazine inhibited the growth of *Pfeifferella mallei in vitro* and also prevented infection of male g.pigs when administered at 100 mg. daily for 7 consecutive days, the treatment starting immediately after inoculation of a lethal dose of the organism.—R. N. MOHAN.

GAVRILOV, A. I. (1957). **[Histological changes in the central nervous system of oxen producing immune serum against erysipelas.]**— *Uchen. Zap. Vitebsk. vet. Inst.* **15,** 45-49. [In Russian.] **947**

G. examined 5 oxen aged 5–9 years which had been used for serum production for from 1 to 5 years. They had general weakness, verrucose endocarditis, and dystrophic changes in the parenchymatous organs and the nervous system. There were atrophic foci in the cerebral cortex and cerebellum; dystonia of brain capillaries with perivascular haemorrhages; atrophy of astrocytic glia, microglia and ependymal cells in all parts of the brain; slight proliferation of oligoglia.—R.M.

HARTWIGK, H. (1958). Zum Nachweis von Listerien in der Kuhmilch. **[Demonstration of listeria in cows' milk.]** — *Berl. Münch. tierärztl. Wschr.* **71,** 82-85. [Summary in English.] **948**

H. confirmed the value of oblique illumination in identifying smooth cultures of *Erysipelothrix* (*Listeria*) *monocytogenes* [see also *V.B.* **28,** 342]. For milk containing 100 listeria to every 500,000 contaminating organisms per ml., nutrient agar was suitable for colony detection. For more heavily contaminated milk, agar plus 0·05% potassium tellurite was a satisfactory selective medium.—R.M.

I. SELIVANOV, A. V. & GRINITSUINA, G. A. (1958). **[Survival of listeria in meat.]** —

Veterinariya, Moscow **35,** No. 6 pp. 37-38. [In Russian.] **949**

II. Slivko, V. V. (1958). **[Survival of listeria in meat.]**—*Veterinariya, Moscow* **35,** No. 6 pp. 39-40. [In Russian.] **950**

I. Pieces of mutton were infected with 48-hour cultures of listeria. The meat was not infective for mice after it had been boiled for 1 or 3 hours, but it remained infective after storage at −10° and −23°C. for 18, 24, 48 or 480 hours, and after pickling in brine for 20 days.

II. Although the organism could be isolated from brain spleen, liver, kidney, heart and lymph nodes, it was never isolated from muscle of pigs and lambs which had died from listeria infection. The author suggested that meat from emergency-slaughtered animals with septicaemia or meningo-encephalitis could be issued for human consumption after storage for 40 days in brine. There was no need for restrictions on the use of meat from animals free from symptoms but reacting to agglutination tests for listeria.—E. L. Urch.

Hessen, L. (1958). Listeriose i kjøttkontrollen. **[Identification of listeriosis in meat inspection.]** — *Nord. VetMed.* **10,** 586-590. [In Norwegian. Summaries in English and German. English summary modified.] **951**

H. described briefly a method for identification of listeria-infected meat of slaughtered small ruminants. The anterior portion of the cervical spinal cord is examined bacteriologically with a special view to identification of animals slaughtered in emergency on account of listeria encephalitis. The use of this method in the examination of 8 emergency slaughtered ewes revealed 3 cases of listeriosis while the ordinary bacteriological examination was negative.

A bacteriological examination of the brain or the anterior portion of the cervical spinal cord is recommended as part of the routine inspection of emergency-slaughtered small ruminants.

Smith, G. R. (1958). **Experimental infections of *Pasteurella haemolytica* in mice and their use in demonstrating passive immunity.**—*J. comp. Path.* **68,** 455-468. [Author's conclusions modified.] **952**

True infections of *Past. haemolytica* can be produced in mice by intraperitoneal inoculation of organisms mixed with mucin, or by intracerebral inoculation. Using either method it is possible to demonstrate protection in mice by hyperimmune rabbit serum injected intraperitoneally. Intraperitoneal injection of organisms in mucin is by far the more successful of the two challenge procedures.

Cerebral infections can be produced by intravenous administration of organisms followed by injection of sterile starch solution into the brain.

Heddleston, K. L. & Hall, W. J. (1958). **Studies on pasteurellosis. II. Comparative efficiency of killed vaccines against fowl cholera in chickens.**—*Avian Diseases* **2,** 322-335. [Authors' summary modified.] **953**

Studies with six killed *Pasteurella septica* vaccines against fowl cholera are reported; one was commercial and five experimental (emulsified, aqueous-suspended, alum-precipitated, chick-embryo, and capsular).

A single dose of emulsified *Past. septica* vaccine conferred an effective immunity for at least 9 months. Two doses of aqueous-suspended vaccine were more effective than one in maintaining immunity up to 6 months. A single dose of emulsified vaccine was superior to two doses of aqueous vaccine in producing an immunity of long duration. The emulsified capsular vaccine conferred an effective immunity for at least 25 weeks. The alum-precipitated vaccine, the chick-embryo vaccine and the commercial vaccine were of questionable value, in the dosages and concentrations employed.

Alvarez, E. (1958). Sobre dos casos de adenitis equina a *Pseudomonas aeruginosa*. **[Strangles associated with *Ps. aeruginosa* in two foals.]** —*Rev. Vet. Milit., B. Aires* **6,** 167-169. **954**

Strangles associated with *Ps. pyocyanea* is reported in Argentina for the first time. Two foals, 2 and 3 months old, were affected with the atypical pulmonary form. The organism was isolated in pure culture from pus in pulmonary abscesses. A mild form of the disease was produced in two yearling foals by s/c inoculation and nasal scarification with cultures of the organism. Bacteria-free filtrates of pus did not cause the disease.—M.G.G.

Farrell, R. K., Leader, R. W. & Gorham, J. R. (1958). **An outbreak of hemorrhagic pneumonia in mink. A case report.**—*Cornell Vet.* **48,** 378-384. **955**

An outbreak of haemorrhagic pneumonia due to *Pseudomonas pyocyanea* is reported in mink kits in the U.S.A. Deaths occurred within a few hours of the first signs of dyspnoea and frothy discharge from the nares. The outbreak was controlled by treating contacts with streptomycin and sulphathiazole and by sanitation and isolation measures. Gross and microscopic findings are described.—A. Ackroyd.

I. CALAPRICE, A. (1958). Contributo allo studio dell'infezione da *Bacillus pyocyaneus* (*Pseudomonas aeruginosa*) nei polli. [*Pseudomonas pyocyanea* **infection in fowls.**]—*Zooprofilassi* **13,** 323-329. **956**

II. FONTANELLI, E. (1958). Una infezione da Pseudomonas aeruginosa nei polli da carne in batteria. [*Pseudomonas pyocyanea* **infection in battery-reared table fowls.**]—*Ibid.* 331-334. **957**

I. The disease affected chickens aged 40–45 days. Clinical signs were dullness, ruffled feathers, anorexia and diarrhoea. Mortality, at first low, reached high proportions (about 1,000 died in a few days). P.M. findings included congestion of the visceral organs, enlargement of the spleen, catarrhal and haemorrhagic enteritis and, in some cases, minute abscesses in the kidneys. Microscopic examination of liver, spleen, kidney and lung revealed *Ps. pyocyanea*. Broth cultures, injected i/p or i/v, killed rabbits and g.pigs in 3 days; chickens died 16–24 hours after i/v or i/m inj. Treatment with streptomycin gave good results. The pathogenesis of the condition is discussed.

II. The disease, characterized by oedematous swellings about the head, dullness and inappetence, was sudden in onset and affected fowls aged 5–6 weeks. Death supervened in 48–72 hours. Total mortality was 3%. The only P.M. findings were occasional haemorrhages in the body cavities and the oedematous swellings (in the head region) from which a yellowish, odourless liquid exuded on section. *Ps. pyocyanea* was isolated in culture from the oedematous lesions, bone marrow, liver and spleen. The infection stopped as suddenly as it had started; this is ascribed to improvement of hygienic conditions and to the administration of antibiotics.—T.E.G.R.

EICHLER, W. (1958). Behandlungsversuche der Kerato-Konjunktivitis infectiosa des Rindes beim Seuchenzug auf Ummanz im Jahre 1953. **[Treatment of infectious bovine keratoconjunctivitis.]**—*Arch. exp. VetMed.* **12,** 173-177. **958**

Of various treatments tried, the best results were obtained with an eye ointment containing 5% chloramphenicol and 2% sulphathiazole. Satisfactory results were obtained with sulphathiazole eye ointment or i/v inj. of neoarsphenamine, but penicillin and streptomycin preparations were ineffective.—R.M.

DHANDA, M. R. & CHANDRASEKARIAH, P. (1958). **Bacterial meningoencephalitis in a dairy calf due to infection with** *Klebsiella pneumoniae*. —*Indian vet. J.* **35,** 553-559. [Authors' summary modified.] **959**

The occurrence of *K. pneumoniae*, Type 25, in the brain and meninges of a dairy calf, 3 months old, that died suddenly exhibiting symptoms suggestive of brain involvement is reported. The morphological and cultural characters and the biochemical and serological reactions of the organism are described. The organism was highly pathogenic for mice.

LAWS, L. & HALL, W. T. K. (1958). *Chromobacterium violaceum* **infection in a pig.**—*Qd J. agric. Sci.* **15,** 145-149. [Authors' summary modified.] **960**

A *Chromobacterium* was isolated on 10% sheep's blood agar and McConkey agar from abscesses in the lung, liver and mammary region and also from the swollen mediastinal lymph nodes of a pig. This organism grew at 25° or 37°C. but not at 4°C. It was haemolytic and produced a violet pigment on blood agar. Gelatin and Loeffler's media were liquefied. In liquid media a pale violet pellicle was formed. The organism was pathogenic for mice and mildly pathogenic for guinea-pigs.

Three other strains biochemically and morphologically similar to the pig strain and with similar pathogenicity for guinea-pigs and mice were recovered from muddy water.

The nomenclature of this species is discussed. The above strains appeared to fit most closely with *Chr. violaceum* var. *manilae*.

FEY, H. & STÜNZI, H. (1958). Colimastitis und Coli-Nekrotoxin. **[Bovine mastitis caused by *E. coli*: the role of necrotoxin.]** — *Schweiz. Arch. Tierheilk.* **100,** 325-329. [Summaries in English, French and Italian.] **961**

Based on histological examination of the udder in 30 cows with *Escherichia coli* mastitis and demonstration of necrotoxin formation by some of the strains isolated, the authors concluded that necrosis of mammary tissue developed irrespective of necrotoxin formation by *E. coli*.—E.G.

PODKOPAEV, V. M. (1957). **[Intestinal microflora of healthy calves and calves with toxic dyspepsia.]** — *Sborn. Trud. Leningrad. nauchno-issled. vet. Inst.* No. 7 pp. 45-55. [In Russian.] **962**

P. defined toxic dyspepsia (or white scours) as non-contagious diarrhoea of young calves. He studied the microflora of the abomasum, duodenum and large intestine of healthy calves between a few days and 4 months of age (some

with abomasal cannulas) and of calves with toxic dyspepsia from several different farms.

There was a clear difference in the quantitative relationship between Gram-positive and Gram-negative organisms from heathy and sick calves: in healthy unweaned calves 60–90% of intestinal micro-organisms were Gram-positive, while in sick calves only 10–40% were. In sick calves the remainder of the microflora was composed of the following Gram-negative organisms: *Bact. cloacae, Bact. liquefaciens, "Bact. proteus liquefaciens", Proteus vulgaris, Ps. pyocyanea, E. coli, Bact. aerogenes, "Bact. faecalis aerogenes"* and paracolon bacteria. In healthy calves this group accounted for 10–40% of the microflora.

Factors contributing to the establishment of a faulty microflora were studied in experimentally and spontaneously infected calves and treatment was discussed.—R.M.

I. Rastegaeva, A. M. (1957). **[Microbiological studies on oedema disease (enterotoxaemia) of pigs.]**—*Sborn. Trud. Leningrad. nauchno-issled. vet. Inst.* No. 7 pp. 11-23. [In Russian.] **963**

II. Rastegaeva, A. M. (1958). **[Aetiology of oedema disease of pigs.]**—*Veterinariya, Moscow* **35,** No. 7 pp. 25-27. [In Russian.] **964**

I. & II. Beta-haemolytic coli bacilli were isolated from the small and large intestines and mesenteric lymph nodes of 50 cases of oedema disease. In intestines from 82 healthy slaughtered pigs, coli bacilli were isolated only 11 times, and they were always outnumbered by non-haemolytic colonies. 120 strains of haemolytic coli bacilli from healthy and affected pigs on different farms in a large area were compared. Their biochemical properties were identical. Agglutination tests were performed with these strains, using sera from rabbits hyperimmunized with one of 3 different strains: the majority were agglutinated by serum from a rabbit hyperimmunized with an oedema disease strain and were not agglutinated by hyperimmune serum against a strain isolated from a pig with swine fever.

Experimental inoculation of mice and piglets with cultures or with preparations of endotoxin and exotoxin was reported. Of 3 piglets inoculated [? i/v] with polysaccharide endotoxin prepared by the method of Boivin, 2 died. Of 13 piglets inoculated with an extract prepared by tenfold freezing and thawing of a 3-day culture, 8 died. When 7 were inoculated with a similar extract of coli bacilli isolated from a different disease, only 2 died. Nine piglets inoculated with extract of coli bacilli from healthy pigs all remained alive. Soon after inoculation all pigs developed shock, prostration, dyspnoea, diarrhoea and vomiting. But whereas pigs inoculated with extracts of cultures from healthy pigs soon recovered, those inoculated with extracts from oedema disease strains died within 7–24 hours, developing attacks of screaming, convulsions, paralysis, and "swimming" movements. Lesions found in these pigs were similar to those occurring in spontaneous cases of oedema disease. R. concluded that oedema disease was an enterotoxaemia caused by toxin formed from coli bacilli in the intestine.
—R.M.

Johnson, R. H. (1958). **Notes on some West African salmonelloses.**—*Bull. epiz. Dis. Afr.* **6,** 249-253. [Summary in French pp. 286-287. Author's summary modified.] **965**

Data on salmonelloses of various animals in West Africa are presented. Three new serotypes are described, and several new hosts are reported.

Jensen, P. T. (1959). Salmonella typhi murium hos føl og heste. **[*S. typhi-murium* in foals and mares.]**—*Medlemsbl. danske Dyrlaegeforen.* **42,** 1-8. [In Danish.] **966**

Two outbreaks of salmonellosis in two studs were investigated. The two were connected, in that a mare and foal from one stud had been stabled at the other stud. In the two outbreaks three foals, 2–3 months old, died from infection with *S. typhi-murium* (fermentation Type 17). Faeces examination of mares and foals revealed 5 latent infections (2 mares, 3 foals); one of these foals became acutely infected but was cured. The four other carriers had ceased to excrete the organism after 2 months. Investigation of the source of infection revealed that a leaking drain had contaminated the grazing paddock. Resistance tests showed that chloramphenicol was the only active antibiotic.
—F.E.W.

Schütz, G. (1958). Über das Vorkommen seltener Salmonella-Typen in Galle und Kot gesund geschlachteter Rinder und Schweine. **[Occurrence of rare salmonella types in bile and faeces of healthy slaughtered cattle and pigs.]**—*Inaug. Diss., Munich* pp. 38. **967**

The bile and faeces of 511 healthy slaughter cattle and 520 healthy slaughter pigs were examined for salmonella. *S. dublin* was isolated from the bile and faeces of one of the cattle, and 11 salmonella types were isolated from the faeces of 26 pigs. They were *S. typhi-murium, montevideo, oranienburg, bareilly, infantis,*

muenchen, kentucky, orion, newington, binza and *goerlitz*. The literature on the occurrence of rare salmonella types in Germany is reviewed. —M.G.G.

BESSARABOV, B. F. (1957). **[Specific prophylaxis of swine paratyphoid.]** — *Trud. Mosk. vet. Akad.* **19**, No. 1. pp. 294-297. [In Russian.] **968**

17 sows in the last stages of pregnancy were inoculated once with 5 ml. formolized swine paratyphoid vaccine. 55 of their 144 piglets subsequently developed paratyhoid and 9 died, compared with 100 infected and 7 deaths among 132 piglets from 15 unvaccinated sows. Serum trom some vaccinated sows had agglutinin titres of from 1 : 25 to 1 : 100 9 weeks after vaccination. —R.M.

KRINOCHKIN, A. D. (1957). **[Liquid disinfection of farm buildings infected with paratyphoid.]** —*Trud. Mosk. vet. Akad.* **19**, No. 1. pp. 273-282. [In Russian.] **969**

Salmonella differed in their susceptibility to the action of disinfectants: *S. enteritidis* and *S. abortus-equi* were more resistant to sodium hydroxide than *S. cholerae-suis*. Two new disinfectants were tested. "Xylonaft 5" was described as a mixture of heavy and light xylenols (43%) with saponified "acidol soap-naphtha no. 50" and not more than 15% water. "Slanasid 107" was a mixture of 43% crude shale phenols with "acidol soap-naphtha no. 50". These 2 preparations and sodium hydroxide effectively disinfected contaminated objects soaked for 2 hours in 5% concentrations of either disinfectant at 16°–18°C. or 3–4% conc. at 60°.—R.M.

PANTALEON, J., PORPORIS, J., BARRET, J. & BOUTON, P. (1958). Recherches sur les salmonelles des viandes. **[Studies on salmonella in meat.]**—*Bull. Acad. vét. Fr.* **31**, 129-138. Discussion: pp. 138-140. **970**

Samples of minced beef, pork and horseflesh in butchers' shops were subjected to cultural tests for salmonella. All of 24 beef samples were negative; one of 36 pork samples yielded *S. anatum;* 19 of 93 samples of horseflesh yielded salmonella (14, *S. meleagridis;* 2, *S. meleagridis* and *S. infantum;* 1 *S. meleagridis* and *S. anatum;* 3, *S. anatum*). The possibility of endogenous contamination was ruled out for horseflesh and beef. The possibility of surface contamination was investigated. In the case of horses, of 20 samples from the abdominal and pelvic cavities 1 yielded *S. meleagridis;* 1, *S. coeln;* of 20 strips from superficial muscles (cutaneous, cervical and scapular) 7 yielded *S. meleagridis;* 1, *S. anatum;* 1, *S. coeln*. Results were negative for cattle. Of 18 samples of contents of caecum and large intestines from horses 6 yielded *S. meleagridis*. Similar tests in respect of cattle gave negative results. It is concluded that apparently healthy horses may harbour salmonella in their digestive tract and contamination of sound carcasses may occur. Attention is drawn to the public health aspect and to the need for hygienic conditions in abattoirs and strict application of sanitary laws.—T.E.G.R.

MERLE, A. (1958). Les salmonelloses dans les abattoirs et dans les élevages d'après leurs rapports avec la santé humaine. **[Salmonellosis in animals in relation to human infections.]** —*Bull. Off. int. Epiz.* **49**, 441-482. **971**

Statistics of food-poisoning in man and of salmonella isolated from slaughter animals during the past few years are summarized for different countries in Europe, Africa, Asia, Australia and New Zealand. The mechanism of salmonella food-poisoning is discussed. It is considered that the role of salmonella in food-poisoning has been overrated, and that contamination of meat often takes place after it has left the abattoir. Prophylaxis must include not only inspection at the abattoir, but also precautions at every stage where meat and meat products are handled.—M.G.G.

ORLANDELLA, V. & SQUERI, L. (1958). Osservazioni al microscopio elettronico della S. pullorum e della S. gallinarum. **[Electron microscopy of *Salmonella pullorum* and *S. gallinarum*.]**—*Zooprofilassi* **13**, 381-386. **972**

The technique adopted is described. There was no morphological difference between the two organisms, which were highly pleomorphic and varied in size. After incubation for a few hours globular forms appeared. Other forms undergoing lysis could also be seen; these had small polar masses, a cellular and a cytoplasmic membrane, and the protoplasm was compressed. —T.E.G.R.

HARBOURNE, J. F. (1958). **Some notes on the epidemiology of fowl typhoid.**—*Vet. Rec.* **70**, 443-445. **973**

After enumerating some of the predisposing factors in fowl typhoid and describing the signs of an impending outbreak, H. discussed transmission through the egg and the more extensive spread of the disease from acutely infected birds than from carriers. Carcasses can be a dangerous source of infection by spread to vermin and wild birds and contamination of the ground,

but the frequent seasonal recurrences on some farms appear more likely to be associated with carrier fowls. Both sexes are equally susceptible, but not all age groups. Immunity after the acute form lasts some time, but fatal re-infection within 1–2 years despite the presence of agglutinins in the blood has been observed.

—A. Ackroyd.

Brobst, D., Greenberg, J. & Gezon, H. M. (1958). **Salmonellosis in poultry and poultry processing plants in western Pennsylvania.**—*J. Amer. vet. med. Ass.* **133,** 435-437. **974**

Eight small poultry processing plants were each visited 5 times. and swabs were taken of the cloaca or abdominal cavity in 843 chickens and 41 ducks and also of the equipment. None of 263 cloacal swabs from the chickens yielded salmonella, while 26 of 580 from the abdominal cavity yielded *S. typhi-murium* (25 times) and *S. kentucky* (once). *S. typhi-murium* was also isolated from 3 of the 5 vats where the carcasses were chilled before evisceration. All these isolations were made on the same day from the same plant. Three weeks later *S. typhi-murium* was isolated from faeces at this plant. *S. tennessee, S. heidelberg* and *S. anatum* were isolated from 3 of the 41 ducks, each at a different plant.—M.G.G.

Rössger, M. (1958). *Salmonella give* im Fischmehl inländischer Produktion. [*S. give* **in German fish meal.**]—*Mh. VetMed.* **13,** 468-470. **975**

Of 177 samples of fish meal imported into Germany since December 1955, 21 yielded salmonella, of 8 types. Of 100 samples of fish meal manufactured by a factory in Rostock, 11 yielded *S. give,* one of these yielding a mixed culture of *S. give* and *S. anatum. S. give* was also isolated from an empty sack used for delivering the meal. As the sacks were used over and over again, without disinfection, it is concluded that these were the source of contamination.—M.G.G.

Cury, R. & Troise, C. (1957). Técnica de borbulhamento no preparo de vacinas. I. Estudos sôbre vacinas contra infecções por *Salmonella dublin.* II. Estudos sôbre vacinas contra infecções por *Salmonella abortivo-equina, gallinarum, choleraesuis* e *kunzendorf.* [**Aeration technique for vaccine production. I.** *S. dublin* **vaccines. II. Vaccines against** *S. abortus-equi, gallinarum,* **and** *choleraesuis.*]—*Arch. Inst. biol., S. Paulo* **24,** 1-34 & 35-45. **976**

Troise, C. & Cury, R. (1957). Técnica de borbulhamento no preparo de vacinas. III. Experiências de campo com vacinas borbulhadas contra salmoneloses. [**Aeration technique for vaccine production. III. Field trials of salmonella vaccines.**] — *Ibid.* 47-60. **977**

Cury, R. & Troise, C. (1957). Técnica de borbulhamento no preparo de vacinas. IV. Estudos sôbre ação da clorofila nas endotoxinas das salmonelas e seu emprego nas vacinas borbulhadas. [**Aeration technique for vaccine production. IV. Action of chlorophyll on salmonella and its use in vaccines from aerated cultures.**] — *Ibid.* 61-68. [English absts. modified.] **978**

I. & II. Very effective vaccine against salmonella infections in animals can be obtained after growing organisms in liquid culture media through which filtered air is continuously bubbled.

Eighteen media were tested to select the best.

In tests in mice the different batches of vaccine showed a high immunizing power and there were no accidents due to bacterial endotoxins.

The technique was suitable for large-scale vaccine production.

III. Vaccines against calf diarrhoea, abortion in mares, typhoid of young pigs and fowl typhoid were inoculated into 1,758 calves, 30 mares, 2,450 pigs and 7,322 fowls. The different batches tested showed a high immunizing power and there were no accidents due to bacterial endotoxins.

IV. Chlorophyll neutralizes the endotoxins present in salmonella cultures. Vaccines obtained from cultures treated with chlorophyll produce no undesirable general or local reaction when injected into mice. Water-soluble chlorophyll does not affect the protective power of the vaccine when added to the culture before formalin. When added to the culture medium before inoculating the organism, chlorophyll, especially insoluble chlorophyll, slightly inhibited growth.

Meynell, G. G. & Meynell, E. W. (1958). **The growth of micro-organisms** *in vivo* **with particular reference to the relation between dose and latent period.**—*J. Hyg., Camb.* **56,** 323-346. **979**

The results of previous experiments [*V.B.* **28,** 988] suggested that death following inoculation of a strain of intermediate virulence was ultimately due to the multiplication of a fraction

of the inoculum far larger than that predicted by the hypothesis of independent action. The discrepancy was attributed to the effect of a breakdown in resistance caused by the predicted fraction which enabled other inoculated organisms to multiply progressively and to contribute to the number of organisms causing death. The results of the present experiments indicate that they were not explicable on the simple form of the hypothesis, which makes no allowance for a breakdown, but could be easily accounted for if the hypothesis was extended to include this effect. A short account of the hypothesis of independent action in its simplest and extended forms is therefore given, followed by a model for the multiplication of organisms *in vivo* suggested by the relation between dose and latent period observed in infective systems.

SALTON, M. R. J. & SHAFA, F. (1958). **Some changes in the surface structure of Gram-negative bacteria induced by penicillin action.** —*Nature, Lond.* **181,** 1321-1324. **980**

The bacteria studied were *S. gallinarum* and *V. metchnikovii*. It was suggested that the formation of round bacterial cells in the presence of penicillin was due to interference in the formation of the rigid "mucocomplex" structure of the cell wall.—R.M.

MINGLE, C. K. (1958). **Brucellosis in livestock: control and eradication.** — *Ann. N.Y. Acad. Sci.* **70,** 557-563. **981**

The current programme in the U.S.A. consists of 4 plans: (a) test, slaughter with or without calf vaccination; (b) test, calf vaccination and temporary retention of reactors; (c) calf vaccination without testing any part of the herd; (d) adult vaccination. Plan (a) is the method of choice wherever possible. Strain 19 vaccination, started in 1941, has been used consistently since; the results are impossible to evaluate accurately but it has undoubtedly played a very important role in reducing the previous high incidence of infection. In 1954 Congress approved an accelerated programme and all the testing etc. was stepped up. The ring test has been found most valuable, and modified certified brucellosis-free areas (in which the infection rates do not exceed 1% for animals and 5% for herds) have been extended. As progress to certification occurs efforts must be made to deal with the disease in pigs, sheep, and goats.

—W. K. DUNSCOMBE.

DAFAALLA, E. N. & KHAN, A. Q. (1958). **The occurrence, epidemiology and control of animal brucellosis in the Sudan.**—*Bull. epiz. Dis. Afr.* **6,** 243-247. [In French pp. 283-285. Authors' summary modified.] **982**

The position of animal brucellosis in the Republic of the Sudan is reviewed. Brucellosis has been confirmed in several parts of the country and probably exists in other parts. It is believed that crowding and shade in dairy farms have encouraged the disease. Methods of control are described.

OTTOSEN, H. E. (1958). Diagnostic des brucelloses animales. **[Diagnosis of brucellosis in animals.]**—*Bull. Off. int. Epiz.* **50,** May. pp. 94-106. [English summary modified.] **983**

In cases of abortion, infection with brucella may be diagnosed by microscopic examination of cotyledons and by sero-agglutination; with a combination of these two procedures an accuracy of more than 95% is obtainable. Cultural examination and animal inoculation are therefore unnecessary.

Besides agglutination, the milk ring test is a most valuable sero-diagnostic test, while complement fixation may be useful as a supplementary test in special cases. The semen-agglutination test is of value for examination of bulls, and the vaginal-mucus agglutination test may be serviceable in cases where other methods yield doubtful results.

In the interpretation of agglutination tests, a fixed limit between positive and negative reactions should not invariably be adhered to.

It is considered that the intradermal allergic test would be applicable in the routine supervision of herds free from brucella infection.

BOULANGER, P. & SMITH, A. N. (1958). **Preliminary results with a whole-blood agglutination test for bovine brucellosis.**—*Proc. 61st Ann. Meet. U.S. live Stk sanit. Ass., St. Louis,* 1957. pp. 94-103. **984**

Antigen for the test was a 4% suspension of *Br. abortus* stained with haematoxylin and suspended in physiological saline at pH 4–4·3. Heparin (80–160 i.u.) was added to each ml. of antigen. A wire loop was used to collect blood from an incision in the ear or tail. Blood was mixed with a drop of antigen on a warm glass plate. Agglutination in positive cases occurred within 10 or 15 min. When compared with results of tube agglutination tests on 300 unvaccinated cattle, the whole-blood tests gave 18% false-positive but no false-negative results. With 638 vaccinated cattle the whole-blood test gave 21% false-positive reactions. The test was recommended as a screening procedure for range

cattle, since those negative to the test could be released at once while reactors were retained and bled for the tube agglutination test.—R.M.

SEELEMANN, M. & MEYER, A. (1958). Zur Frage der Standardisierung des Testes für die Abortus-Bang-Ringprobe (ABR-Test). **[Standardization of the brucella ring test.]** — *Tierärztl. Umsch.* **13,** 33-35. **985**

A standard procedure for the *Br. abortus* ring test was proposed.—R.M.

BIZIN, E. A. (1957). **[Effect of single and double freezing of serum samples from cattle on serological tests for brucellosis.]**—*Sborn. nauch. Rabot Altaĭ. nauchno-issled. vet. Stantsiya* No. 1. pp. 29-31. [In Russian.] **986**

Freezing of serum samples while being conveyed from the farm to the lab. in winter did not affect the results of agglutination and c.f. tests performed on the sera.—R.M.

GEISSLER, A. (1958). Schutzimpfungsversuche mit Abortus-Bang-Totimpfstoff an Rindern. **[Experimental immunization against bovine brucellosis with a killed vaccine.]** — *Mh. VetMed.* **13,** 331-337. **987**

Of 13 heifers immunized with killed (chinosol) vaccine against brucellosis, seven resisted massive experimental infection, the remainder either aborted, gave birth prematurely or developed uterine lesions. Of four heifers immunized with Strain 19, two aborted. Only one of eight controls resisted infection.—E.G.

CHERNIGOV, V. D. (1957). **I. [Experimental study of adsorbed and non-adsorbed vaccines prepared from Strain 61 of *Brucella suis*.] II. [Trials in cattle of adsorbed and non-adsorbed vaccines prepared from *Brucella suis* Strain 61.]**—*Trud. Mosk. vet. Akad.* **19,** No. 1. pp. 224-234 & 251-257. [In Russian.] **988**

I. 29 sheep, 22 g.pigs and 52 mice were inoculated with a suspension of Strain 61 [*V.B.* **27,** 3203] either in buffered saline or in aluminium hydroxide suspension. Tests on the lab. animals indicated that the aluminium hydroxide vaccine gave the best immunity. 5 of 5 ewes resisted challenge with *Br. melitensis* 4½ months after inoculation of adsorbed vaccine, compared with 4 of 5 ewes inoculated with non-adsorbed vaccine.

II. 94 cows, most of them pregnant, were divided into 3 groups and inoculated with Strain 19 vaccine or adsorbed or non-adsorbed Strain 61 vaccine. Agglutination and c.f. tests were performed on serum at intervals up to 240 days after vaccination. Agglutination titres of 1:400 were attained by the 29th day in all the cows inoculated with adsorbed Strain 61 and in 82% in the case of non-adsorbed Strain 61. After 240 days the proportion of cows reacting was 87·5, 86 and 79% respectively. Strain 61 vaccine did not cause abortion when inoculated in the second half of pregnancy, whereas Strain 19 caused isolated abortions. The cows were not challenged with *Br. abortus*.—R.M.

TRILENKO, P. A. *et al.* (1957). **[Results of vaccination with *Br. suis* Strain 64 in the control of bovine brucellosis.]**—*Sborn. Trud. Leningrad. nauchno-issled. vet. Inst.* No. 7 pp. 56-66. [In Russian.] **989**

Cattle were inoculated with live vaccine from Strain 64 described by V.A. Nikolaev [*V.B.* **25,** 2704; **26,** 2527]. It did not cause abortion. Antibodies were present in serum of 1 in 5 cows 3 years after inoculation and 1 in 8 after 5 years. It did not provide complete protection against abortion and it was recommended that where Strain 19 vaccine was available it should be used in preference to Strain 64.—R.M.

FLÜGE, A. (1957). Über den Verlauf einer peroralen Infektion tragender Schafe mit einen Brucella abortus Bang-Stamm, der die Merkmale der Brucella melitensis aufweist. **[Oral infection of pregnant sheep with Strain 67, an atypical strain of *Br. abortus*.]** — *Inaug. Diss. Hanover.* pp. 71. **990**

Strain 67 from Weybridge, originally isolated from the milk of a cow, possessed some of the properties of *Br. melitensis*. Its pathogenicity for sheep was tested by oral administration to 2 pregnant ewes. Neither sheep showed symptoms and the organism could not be recovered from blood samples. Both lambed prematurely at 141 and 144 days of gestation; one produced a dead lamb and the other a lamb which died soon after birth. One ewe was slaughtered and the organism was recovered from some lymph nodes, uterus and udder. It was concluded that the strain was *Br. abortus* and was not particularly pathogenic for sheep. Its serological and biochemical properties were not changed by passage in sheep.—R.M.

GLUKHOV, A. S. (1957). **[Protective effect of saliva in healthy sheep against brucella.]** — *Trud. Novocherkassk. zootekh.-vet. Inst.* No. 10 pp. 277-282. [In Russian.] **991**

Saliva collected from a parotid fistula was filtered and added to cultures of 1,000 million or 2,000 million organisms of *Br. abortus* on liver agar or in broth. The cultures were

incubated at 37°C. and samples were taken at intervals and seeded on fresh culture medium. [The volume of saliva added to each culture was not stated.] No organisms survived contact with saliva for 4 hours or more. Experiments in which g.pigs were inoculated with mixtures of brucella and saliva confirmed this finding.
—R.M.

SCHWARZ, H.-J. (1958). Untersuchungen über das Vorkommen von *Brucella abortus* im Fleisch infizierter Meerschweinchen. **[Occurrence of *Brucella abortus* in the musculature of infected guinea-pigs.]** — *Inaug. Diss. Munich* pp. 25. **992**

Of 70 g.pigs infected s/c with *Br. abortus*, 69 were killed after 8 to 45 days and one after 227 days. The last was negative for *Br. abortus*, but in the rest smears revealed *Br. abortus* in the spleen of all 69, in lymph nodes in 62, in the heart blood of 3, and in the musculature of 15. Culture of filtered muscle suspensions revealed the organism in the musculature of a further 4. In no case was *Br. abortus* isolated from both musculature and blood.—M.G.G.

VAN DRIMMELEN, G. C. (1958). **Variation of Brucella melitensis.**—*J. S. Afr. vet. med. Ass.* **29**, 159-168. **993**

Four rabbits were injected with a dense suspension of *Br. melitensis* and were killed from 3–8 months later. In most cases, rough *Br. melitensis* was recovered. Pus from one rabbit, killed after 18 months, yielded smooth *Br. melitensis* (the lapinized brucella). G.pigs were injected with this pus and, from one of them, a pure culture was obtained from the spleen which, in its biochemical and serological properties, was identical with *Br. abortus*. This was called the cavianized strain.

Agglutinaton and agglutinin-absorption experiments with these strains, together with a typical *Br. abortus* strain, revealed some conflicting results. The lapinized strain, (*Br. melitensis*), although agglutinated by monospecific melitensis serum, was not agglutinated by non-absorbed melitensis or abortus sera. But a serum prepared against this lapinized strain agglutinated both homologous and *Br. melitensis* antigens. However, it should be pointed out that a period of 3 months elapsed between vaccination and collection of serum and, furthermore, different results were obtained depending on whether living or killed cells were used for the production of sera for the absorption tests.

On the basis of these results, the author suggests that there is only one species of brucella, viz. *Brucella melitensis* and that all other strains are varieties of this species: *e.g. Br. abortus* should be renamed *Br. melitensis* var. *abortus*.

[Not all workers will agree with the author's statements that "rough" cells of Strain 19 are inferior to "smooth" cells of Strain 19 in antigenic and immunogenic properties, and that "brucella species possess major and minor agglutinins".]—W. J. BRINLEY MORGAN.

VERSHILOVA, P. A. & GREKOVA, N. A. (1958). **[Intranasal immunization of guinea-pigs with live brucella vaccine.]** — *J. Microbiol., Moscow* **29**, No. 11 pp. 16-20. [In Russian.] **994**

Strain 19 vaccine was instilled in doses of 5,000 million organisms into the nostrils of g.pigs. The results were compared with g.pigs inoculated s/c with 1,000 million organisms. After intranasal inoculation the organism was distributed throughout the body during the first two weeks; it did not completely disappear until 2 months after inoculation (*i.e.* twice as rapidly as after s/c inoculation). After a month 4 of 13 animals resisted challenge with *Br. melitensis*, compared with 7 of 14 inoculated s/c and none of 12 unvaccinated controls.—R.M.

ABERNATHY, R. S., BRADLEY, G. M. & SPINK, W. W. (1958). **Increased susceptibility of mice with brucellosis to bacterial endotoxins.** —*J. Immunol.* **81**, 271-275. [Authors' summary modified.] **995**

Infection with *Brucella melitensis* or *Br. abortus* Strain 19 increased the susceptibility of mice to the lethal action of brucella endotoxin. Mice infected with *Br. melitensis* died within 8–48 hours after challenge with brucella endotoxin. This susceptibility was maximal between 2 and 4 weeks after infection and persisted for at least 8–12 weeks. The degree of susceptibility had no correlation with colony count in cultures of spleen from infected mice. Mice infected with *Br. melitensis* were also susceptible to typhoid and coli endotoxins.

CHERNŸSHEVA, M. I. (1958). **[Cytological method for studying vaccinal immunity in brucellosis.]**—*J. Microbiol., Moscow* **29**, No. 11 pp. 20-25. [In Russian.] **996**

Establishment of immunity after inoculation of g.pigs with a killed vaccine was associated with activation of phagocytosis in reticulo-endothelial elements and the appearance of large numbers of macrophages, but this reaction was mainly confined to the site of inoculation. After inoculation of live Strain 19, the cellular reaction was generalized and the organisms were rapidly taken up by microphages and macro-

phages. Microphages were not able to lyse the organisms but macrophages lysed those ingested during the first 24 hours after inoculation. From cytological evidence, immunity from live vaccine was established by the 15th day.—R.M.

SMIRNOV, S. M. (1958). **[Achievements and prospects in the prophylaxis of brucellosis in the U.S.S.R.]** — *J. Microbiol., Moscow* **29,** No. 11 pp. 4-12. [In Russian.] **997**

Between 90 and 95% of human cases of brucellosis were caused by *Br. melitensis*. Although brucellosis of animals has been controlled in some regions, little progress has been made in Kazakhstan, Central Asia, Northern Caucasus, Transcarpathia and southern parts of the R.S.F.S.R. In 1952 live [Strain BA] vaccine was introduced for human use. Largely as a result of this the incidence of human brucellosis has been reduced by half in the U.S.S.R. as a whole between 1952 and 1957; in some parts (Ukraine, Kirgizia) even greater reductions have been obtained, while in only one region has the incidence increased (Turkmenistan). Intradermal inoculation of the vaccine, instead of s/c, was introduced in 1958, thus effecting a saving in the amount of vaccine used. A prophylactic vaccination scheme for cattle commenced in 1954, and a scheme for sheep commenced in 1956. It was hoped that vaccination combined with sanitary measures would lead to eradication of the disease.—R.M.

BORTS, I. H. (1958). La brucelosis en Iowa, con especial referencia a las lesiones que originan complicaciones, y su terapeutica. **[Human brucellosis in Iowa with reference to complicating lesions and therapy.]**—*Bol. ofic. sanit. pan-amer.* **45,** 145-149. [Summary in English.] **998**

Human brucellosis in the mid-western regions of the U.S.A. is predominantly of porcine origin. Complications encountered are more numerous and severe than those caused by *Br. melitensis* and *Br. abortus*. *Br. suis* strains from cattle appeared to be of a lower virulence than those from man. Details of treatment in man with dihydrostreptomycin and a broad-spectrum antibiotic were given.—E.G.

GASPARDIS, D. (1958). Presenza di anticorpi antileptospire e loro comportamento in sieri di cavalli colpiti da oftalmite recidivante. **[Leptospira antibodies in the serum of horses with periodic ophthalmia.]** — *Clin. vet., Milano* **81,** 73-78. [Summary in English.] **999**

All of 23 horses with periodic ophthalmia had leptospira antibodies (13, *L. icterohaemorrhagiae;* 10, *L. pomona*). High titres persisted for 20–30 days or longer after the onset of ophthalmia and then dropped rapidly; they rose with each attack. Antibodies were demonstrable in some horses for 2–3 years even in the absence of relapses.—T.E.G.R.

KENZY, S. G., GILLESPIE, R. W. H., RINGEN, L. M., OKAZAKI, W., BRACKEN, F. K. & KEOWN, G. H. (1958). **Control of bovine leptospirosis.** — *Proc. 61st Ann. Meet. U.S. live Stk sanit. Ass., St. Louis,* 1957. pp. 137-150. **1000**

This paper describes a comparison of three different vaccines against *L. pomona* infection; preliminary studies of an egg-passaged strain of *L. pomona* as an immunizing agent; and the efficacy of antibiotic therapy. The last subject has been previously dealt with [*V.B.* **25,** 3154 & **27,** 395], but it was shown in addition that 0·5 mg./lb. body wt. of chlortetracycline, added to the food, could prevent experimental infection. A strain attenuated by more than 500 passages in eggs, gave a more rapid and higher antibody response in calves than killed vaccine. But mild nephritis and slight excretion of living leptospires indicated that the strain may require further attenuation.—R.M.

JONES, R. K. (1958). **Study of the viability of *Leptospira pomona* in frozen extended bovine semen.**—*J. Amer. vet. med. Ass.* **133,** 216-218. **1001**

L. pomona survived in serum diluent, prepared without antibiotics, for at least 30 days after freezing and storage at −190°C. and produced a leptospiraemia in g.pigs. Serological responses in g.pigs suggested that the organism could survive storage for at least 108 days. When antibiotics were added, no evidence of survival was observed.—A. ACKROYD.

JELEFF, W. (1958). Beitrag zu den morphologischen Veränderungen bei der Leptospirose der Kälber. **[Morphological changes in leptospirosis of calves.]** — *Mh. VetMed.* **13,** 226-227. **1002**

J. examined 10 calves which died and 38 which were slaughtered during an outbreak of leptospirosis near Sofia. Characteristic lesions were found in liver and kidney; their histology was described.—R.M.

TAMMEMAGI, L. & SIMMONS, G. C. (1958). **Further observations on the experimental infection of pigs with *Leptospira hyos* Savino and Renella.**—*Qd J. agric. Sci.* **15,** 137-144. [Authors' summary modified.] **1003**

Five sows inoculated i/m with *L. hyos*

showed agglutinins and excreted leptospires in the urine. No clinical abnormality attributable to infection with *L. hyos* was observed.

Of 53 piglets born to the five infected sows, 6 were stillborn, and there were 5 mummified foetuses.

SHILL, O. S., JR. (1958). **Effects of environment upon the incidence of canine leptospirosis, with associated pathological implications.** — *Calif. Vet.* **11**, No. 6. pp. 25-26. **1004**

Of 53 stray dogs 13 were positive serologically for *Leptospira canicola*, 4 for *L. icterohaemorrhagiae* and 1 for *L. pomona*. Of 30 male dogs from individual owners 3 were positive for *L. canicola* and 2 for *L. icterohaemorrhagiae*. All of 30 dogs from a university kennel were negative. Interstitial nephritis was found in 6 of 8 positive dogs and in 2 of 23 negative dogs.

—M.G.G.

MURASCHI, T. F. (1958). **Latex-leptospiral agglutination test.** — *Proc. Soc. exp. Biol., N.Y.* **99**, 235-238. [Author's summary modified.] **1005**

M. described a simple macroscopic tube agglutination test for leptospirosis, using an antigen composed of polystyrene latex particles and formol-killed leptospires.

ZIPPLIES, G. (1958). Zur Züchtung von Leptospiren. **[Cultivation of leptospires.]**—*Arch. exp. VetMed.* **12**, 178-192. **1006**

The most suitable medium for *L. bovis, canicola, hebdomadis, icterohaemorrhagiae* and *pomona* was Korthof's plus 10% sheep serum. Differences in growth between the five species were noted. Addition of B vitamins to culture medium appeared to promote growth of leptospires.—R.M.

PHILLIPS, C. E. (1958). **Leptospira vaccine evaluation.**—*Vet. Med.* **53**, 301-307. **1007**

Calves, pigs, dogs and hamsters were injected with the vaccines under test and later challenged with virulent tissue (liver, spleen and kidney) from hamsters. Protection and resistance were also assessed in hamsters by serum titrations. Results are given in tabular form.

—T.E.G.R.

KATIC, R. V., KATIC, D. V. & TRAILOV, Z. (1958). Possibilité d'emploi du vaccin bivalent contre le botulisme et le tétanos. **[Use of a bivalent vaccine against tetanus and botulism in horses.]**—*Rev. Immunol.* **22**, 51-57. **1008**

Horses were vaccinated against tetanus and botulism with an alum-precipitated vaccine consisting of equal portions of *Clostridium botulinum* toxoid Type C, *Cl. botulinum* toxoid Type D, and *Cl. tetani* toxoid. Two s/c injections each of 10 ml. were given 20 days apart, followed by a third 6 months later. Serum from 6 of these horses 20 days after the last injection had satisfactory titres of all 3 antitoxins. In 6 horses vaccinated with *Cl. botulinum* toxoids alone, titres of *Cl. botulinum* antitoxin were as good as in those given the bivalent vaccine. But in 6 horses given *Cl. tetani* toxoid alone titres of *Cl. tetani* antitoxin were lower, which suggests that *Cl. botulinum* toxoid stimulated increased formation of *Cl. tetani* antitoxin.

—M.G.G.

AKKERMANS, J. P. W. M., TERPSTRA, J. I. & VAN WAVEREN, H. G. (1958). De diagnostiek en therapie van de Vibrio fetus-infectie bij stieren. **[Diagnosis and treatment of vibriosis in bulls.]** — *Tijdschr. Diergeneesk.* **83**, 832-841. [In Dutch. Summaries in English, French and German.] **1009**

36 bulls, suspected of being infected with *V. fetus*, were examined. Samples of semen, scrapings of penis and prepuce, and preputial washings were cultured on several different media. From the results a routine procedure for diagnosis was described. Test mating of virgin heifers revealed that 10 of 28 bulls were infected, while culture gave positive results in 13 of 36 cases. 3 bulls gave negative cultures but positive test matings, 1 bull gave positive cultures and negative matings, 17 gave negative cultures and matings, and 7 gave positive cultures and matings.

Treatment consisted of application to the penis and prepuce, under local anaesthesia, of an ointment composed of 600,000 i.u. penicillin and 1 g. dihydrostreptomycin in 80 g. polyethylene glycol ("Carbowax"). Improvement in conception rate after treatment was obtained in 13 of 16 bulls; subsequent attempts to isolate *V. fetus* from the bulls were negative in all 16.

—R.M.

WOHANKA, K. (1958). Zur Frage des Versicherungsfalles bei Vibrio-fetus-infizierten Deckbullen. **[Insurance of bulls against *Vibrio fetus* infection.]** — *Mh. VetMed.* **13**, 525-526. **1010**

The insurance scheme suggested by Voigt & Haase [see *V.B.* **29**, 341] is considered to be unworkable, for two reasons: (1) in Germany bulls are usually prohibited from service for at least a year (not 3 months) after *V. fetus* infection has been eradicated from a stud, (2) insurance companies would not pay compensation

for bulls with *V. fetus* infection when they can be cured by treatment. A scheme to cover losses in bulls that fail to respond to treatment or are prohibited from service is proposed.—M.G.G.

MITSCHERLICH, E., LIESS, B., PRANGE, H., BAUMGARTE, G. & LIETSCH, C.-D. (1958). Die Verbreitung der Vibrio fetus-Infektion des Rindes in den südlichen Kreisen Niedersachsens. **[Incidence of bovine vibriosis in Southern Lower Saxony.]**—*Dtsch. tierärztl. Wschr.* **65,** 490-497. [Summary in English.] **1011**

Blood samples from 1,610 cows and heifers were submitted to the c.f. test for infection with *V. fetus* Type 1; 115 (7%) were positive. Of 1,315 cattle on 160 farms examined by a variety of methods 194 (15%) were positive; the agglutination test with vaginal mucus detected 80, the c.f. test 77, a combination of these 2 tests 23, and culture of vaginal mucus 14. Clinical symptoms were seen in 87 of these 194 cattle. *V. fetus* infection was found in 58 of 115 breeding centres, and in 7 of 46 insemination centres.—M.G.G.

RASBECH, N. O. (1958). Die Bekämpfung der Rindervibriose in Dänemark. **[Control of bovine vibriosis in Denmark.]** — *Dtsch. tierärztl. Wschr.* **65,** 341-344. [Summary in English.] **1012**

The diagnosis of *V. fetus* infection in bulls by test-mating in Denmark is described. A heifer is inseminated with the mixed centrifugates of 3 ejaculates and a preputial washing from a bull, and, over a period of 3 weeks, 6 samples of cervical and uterine mucus are cultured for *V. fetus*. In 1957, of 1,198 bulls in 74 artificial insemination centres tested in this manner, 195 bulls in 21 centres were infected. —M.G.G.

FLORENT, A., VANDEPLASSCHE, M. & HUYSMAN, A. (1958). Evolution de l'infection à *Vibrio foetus* chez la génisse à la suite d'une primo-infection unique. **[The course of *Vibrio fetus* infection in heifers.]**—*Rec. Méd. vét.* **134,** 97-104. [Summary in English.] **1013**

53 virgin heifers were served during natural or induced oestrus by a bull infected with vibriosis. Service was sometimes followed by instillation into the vagina of a few ml. of washings from the preputial sac. The heifers were killed between 1 week and 9 months after service and the oviducts, uterus, cervix and vagina were examined bacteriologically. Infection was at first confined to the vagina, but vibrios were isolated from the uterus after 7 days. Infection of the entire genital tract persisted for 7 weeks after infection, but infection of the cervix and vagina lasted for 8–10 months. —R.M.

LECCE, J. G. (1958). **Some biochemical characteristics of *Vibrio fetus* and other related vibrios isolated from animals.**—*J. Bact.* **76,** 312-316. [Author's summary modified.] **1014**

The reduction of triphenyl tetrazolium chloride in a Thunberg tube by resting cells of a typical strain of *V. fetus* in the presence of sodium lactate was chosen as a model system that was standardized with regard to: harvest time, pH of reduction reaction, concentration of triphenyl tetrazolium chloride, cellular concentration and substrate concentration. Under these standard conditions other substrates were tested for their electron donating capacity. This yielded a pattern of oxidative activity for one strain. The pattern for this strain was compared to the pattern of 26 other strains. It was determined that the oxidative capacity of vibrios isolated from farm animals was similar regardless of the host or anatomical location or H_2S–catalase types. Only lactate, formate, pyruvate, α-ketoglutarate, and succinate out of 30 substrates tested served as electron donors.

The growth in heart infusion broth of 11 out of 12 bovine catalase-positive strains of *V. fetus* was inhibited by the addition of 0·8% glycine while none of 5 similar ovine strains was inhibited.

I. MITSCHERLICH, E. & LIESS, B. (1958). Die serologische Differenzierung von Vibrio fetus-Stämmen. **[Serological differentiation of *Vibrio fetus* strains.]**—*Dtsch. tierärztl. Wschr.* **65,** 2-5 & 36-39. **1015**

II. LIESS, B. (1958). Die Isolierung der beim Rind und Schaf vorkommenden Vibrionen und ihre kulturelle und serologische Differenzierung. **[Isolation of vibrios from cattle and sheep and their cultural and serological differentiation.]** — *Mh. Tierheilk.* **10,** 267-292. **1016**

III. MITSCHERLICH, E. & LIESS, B. (1958). Die pathogene Bedeutung der bei Rind und Schaf isolierten Vibrionen. **[Pathogenicity of vibrios isolated from cattle and sheep.]**—*Ibid.* 351-372. **1017**

I. Complement-fixation tests were performed using 12 polysaccharide antigens from different vibrios and sera prepared in rabbits against 9 strains of vibrio. Two antigenic factors (numbered 1 and 2) were found in catalase-positive vibrios and a third in catalase-negative non-pathogenic strains. The antigenic factor of

group 2 gave positive c.f. tests with *Br. abortus* and *Tr. foetus* antibodies. By means of agglutination tests with inactivated suspensions of vibrios, it was possible to distinguish strains of groups 1 and 2 from those of group 3, but it was not possible to differentiate groups 1 and 2 by agglutination.

II. 101 strains were classified by c.f. tests into the three groups. Some catalase-positive strains possessed group 3 antigen. A fourth antigenic group was found among catalase-negative strains. Group 1 strains were isolated from genital secretions of cattle. Group 2 came mainly from sheep placentas or aborted foetuses, but some were found in cattle: this group was probably the same as Terpstra's Type III. Group 3 included *V. bubulus*. It was thus possible to differentiate bovine and ovine strains by the c.f. test. Antigenic grouping was compared with cultural and biochemical properties of the strains, and it was found that all strains serologically resembling *V. fetus* were catalase-positive and H_2S-negative.

Techniques for collecting vaginal mucus were compared and vaginal washings gave better results than tampons. Blood agar plates with brilliant green were used for primary isolation. Using this medium, 3 strains were isolated from 112 faeces samples from cattle.

III. *V. fetus* of group 1 was the cause of genital vibriosis in cows. It was identified in 75 of 132 cows which had repeatedly failed to conceive, and in 109 of 494 cows of normal fertility, but was not found in faeces. 4 of 5 cows were experimentally infected by infected semen and a further 3 were infected by intravaginal instillation. No infection occurred after application of cultures to skin wounds, to the conjunctiva, or by the i/v route. *V. fetus* of group 2 was capable of causing sporadic abortion in cows, and was isolated from intestine of a calf which died from enteritis, but its principal role was in genital vibriosis of ewes. I/v inoculation of 3 pregnant ewes with bovine strains did not cause abortion, but the organism was recovered from the placenta of 2 ewes and from the organs of one lamb. Vibrios of groups 3 and 4 were isolated from vaginal secretion of 19 and 4, respectively, of 1,100 cows and once each from faeces. Group 4 vibrios were isolated from preputial washing of 9 bulls. Neither of these groups was pathogenic for cattle.—R.M.

Shotts, E. B., Greer, W. E. & Hayes, F. A. (1958). **A preliminary survey of the incidence of brucellosis and leptospirosis among white-tailed deer (*Odocoileus virginianus*) of the Southeast.** — *J. Amer. vet. med. Ass.* **133,** 359-361. **1018**

In a preliminary survey, using serum plate-agglutination tests, the incidence of positive reactions was 0·25% (brucellosis) and 1·73% (leptospirosis) in some 400 specimens examined from 12 States.—F.E.W.

Pietzsch, W. (1958). Beitrag zur Diagnose und Therapie der chronischen Endometritis des Rindes. (Vergleich zwischen Lugol'scher Lösung und gesättigter Kochsalzlösung.) **[Diagnosis and therapy of chronic endometritis in cows: a comparison of Lugol's solution and saturated saline solution.]**—*Inaug. Diss., Munich* pp. 63. **1019**

Details were given of examination and treatment of post-puerperal endometritis of varying intensity in 100 cows. Eighteen vaginal mucus samples contained bacteria in pure culture, others mainly ubiquitous faecal organisms. Among the organisms isolated were *Escherichia coli* and streptococci—but not *Str. pyogenes, Pseudomonas, Bacillus mesentericus, Proteus* and *Sarcina*. Seven samples were bacteriologically sterile. Of the seven cows one became pregnant after the first, three after the second and one after the fourth service. 38 of 50 cows treated by infusion of 200 ml. of Lugol's soln., and 40 of 50 treated with a similar volume of saturated NaCl soln. became pregnant after subsequent service.—E.G.

Kondyurin, N. G. & Eismont, V. V. (1958). **[Mycoses of horses in Siberia.]**—*Veterinariya, Moscow* **35,** No. 5 pp. 121-122. [In Russian.] **1020**

Several deaths among 2-year-old foals on a state farm were traced to the feeding of mouldy food, consisting of remnants of roughage fed to cattle, and made up mainly of weeds growing on fallow fields. The first deaths occurred 1–2 months after commencement of feeding of the food. An acute form with death after 2–3 days or even after a few hours, and a subacute form of illness were described. Conidia and mycelium were identified in smears of organs from dead horses. A fungus was isolated from organs and was provisionally classified as a torula-like fungus. There was no effective therapy in acute cases, but glucose and 10% calcium chloride soln. i/v and potassium iodide by mouth appeared to be beneficial in subacute cases.

—R.M.

Trofimov, V. P. (1958). **[Role of disinfection in the prophylaxis of ringworm in calves.]**—

Veterinariya, Moscow **35,** No. 6 p. 54. [In Russian.] **1021**

In the Kalinin oblast the number of infected premises fell from 544 in 1951 to 113 in 1957 and the number of infected calves from 11,000 to 1,500. This was attributed to extensive disinfection of calf houses with hot 4% solution of caustic soda. The editor pointed out that according to the findings of the All-Union Institute for Veterinary Hygiene and Ectoparasitology only a mixture of 2% formaldehyde and 1% caustic soda would kill ringworm spores.

—E. L. Urch.

Narasinga Rai, B. & Chandrasekharan Nair, K. P. (1958). **Nocardiosis (actinomycosis) in a dog. A pathological and bacteriological study.**—*Indian vet. J.* **35,** 280-287. **1022**

An aerobic actinomycete resembling *Nocardia asteroides* was isolated from suppurating lesions in the bronchial lymph nodes, lungs and kidneys of a dog. It was highly sensitive to the tetracycline antibiotics *in vitro*.

—R. N. Mohan.

Pereira Rodríguez, R. (1958). Pleuronemonia bovina exudativa contagiosa. **[Bovine contagious pleuropneumonia in Spain.]** — *Bol. Inf. Cons. Col. vet. Esp.* **5,** Nos. 131-132 pp. 31-36. **1023**

Between June 1955 and December 1957, 3,265 complement-fixation tests for pleuropneumonia were performed at the veterinary laboratory, Castellano region, using the technique described by Campbell & Turner [*V.B.* **23,** 3308]. The results of the tests were verified in only a small proportion of cases, but in general they agreed with post-mortem findings. The slide flocculation test described by Priestley [*V.B.* **22,** 2428] was also tried, but was believed to be unreliable. Immunization and control were discussed.—R.M.

Piercy, S. E. (1958). **Present methods of control of contagious bovine pleuropneumonia.** —*Bull. epiz. Dis. Afr.* **6,** 155-164. [Summary in French pp. 195-199.] **1024**

Measures successfully used in highly developed countries for controlling bovine contagious pleuropneumonia may not always be appropriate in East Africa. Two recent technical advances, the slide agglutination test for field screening, and the agar double diffusion precipitation test, have been of considerable practical value. Once diagnosed, restriction of movement of cattle can be enforced, but further identification and slaughter of infected animals cannot until the African stock-owners have had more education. Vaccination with cultures of virulent or attenuated strains of the causal organism have proved unsatisfactory. Reports on the use of dried avianized vaccine have been encouraging, but semi-resistant animals are not immunized. The use of a mild T_1 strain vaccine to immunize completely susceptible animals followed by the use of dried vaccine prepared with the more virulent T_3 strain may be the best solution for control of the disease in East Africa.

—A. Ackroyd.

Hâkioglu, F. & Bögrün, Ö. (1958). Die mit Pleuropneumonia contagiosa caprae (PPLO)-Erreger experimentell durch intramuskuläre, intratestikuläre und subkutane Impfungen hervorgerufenen Infektionen und dabei auftretende Muskelentzündungen. **[Myositis in goats infected experimentally with the agent of caprine contagious pleuropneumonia.]** — *Dtsch. tierärztl. Wschr.* **65,** 157-160. **1025**

Intramuscular inj. of lung exudate from infected goats caused subacute myositis around the site of injection, with hyaline degeneration of muscle fibres and in many cases fibrinous pneumonia. Intratesticular inoculation did not result in pneumonia. After 9 consecutive passages in muscle, the pathogenicity of the pleuropneumonia agent increased. [6 photomicrographs.]—R.M.

Zorabyan, L. I., Piliposyan, T. B. & Iskandaryan, S. A. (1956). **[Treatment and prevention of infectious agalactia of sheep.]** — *Trud. Armyan. nauchno-issled. Inst. Zhivotnovodstva i Veterinarii* **1,** Ser. Vet. No. 9. pp. 51-62. [In Russian.] **1026**

Of various treatments tried, the best results (83% of sheep recovered) were obtained with penicillin combined with novarsenol (neoarsphenamine). Sulphanilamide and streptomycin also gave good results. Penicillin was used in doses of 2 mega units given twice daily for 3–4 days.—R.M.

Hartwigk, H. (1958). Nachweis von pleuropneumonia-ähnlichen Organismen (PPLO) beim Geflügel. **[Demonstration of pleuropneumonia-like organisms in poultry.]** — *Berl. Münch. tierärztl. Wschr.* **71,** 45-50. [Summary in English.] **1027**

Pleuropneumonia-like organisms were isolated from 9 fowls, a peacock, a pigeon, and 26 of 54 chicks, obtained from several sources. P.M. findings were characteristic, but in one emaciated fowl not only fibrinous pericarditis, but also fibrinous inflammation of the external

ear and purulent leptomeningitis were found. It is concluded that the infection occurs in Germany, but was formerly diagnosed as infectious coryza.—M.G.G.

KOPPANG, N. & FILSETH, O. (1958). **The bacterial flora of semen and prepuce in boars.** —*Nord. VetMed.* **10,** 603-609. [In English. Summaries in Norwegian, French and German. English summary modified.] **1028**

The bacterial flora of semen and the preputial diverticulum was examined in 10 boars at an artificial insemination centre. The predominant flora consisted of *Pseudomonas* species in 9 of the boars. In addition, haemolytic streptococci, *Micrococcus tetragenus, Escherichia coli,* micrococci, *Proteus* species and a "coryneform" organism were demonstrated. The contents of the preputial diverticulum are very rich in bacteria.

See also abstr. **1162** (research on animal diseases in Australia); **1164** (zoonoses in the French Sudan); **1264-1265** (report, Mukteswar).

DISEASES CAUSED BY PROTOZOAN PARASITES

HOARE, C. A. (1958). **Public health hazards of amoebiasis in the light of its host-parasite relations.** — *Roy. Soc. Hlth J.* **78,** 681-684. Discussion: pp. 685-686. **1029**

A new concept of amoebiasis is proposed. The human entamoebae with 4-nucleate cysts are represented by 3 types: the non-pathogenic *Entamoeba hartmanni* and 2 types of *E. histolytica* which differ in virulence, one a harmless commensal and the other a pathogen capable of invading the host's tissues. *E. hartmanni* and the non-pathogenic type of *E. histolytica* have a world-wide distribution, whereas the pathogenic type is restricted to tropical and sub-tropical regions. In discussion on the paper W. P. Stamm disagreed with this hypothesis and suggested that poor hygiene and other predisposing factors such as bowel flora caused amoebiasis. In reply Hoare stated that whichever hypothesis was correct, the public health hazards of amoebiasis were much less than was generally assumed.—M.G.G.

THURSTON, J. P. (1958). **The effect of immune sera on the respiration of *Trypanosoma brucei in vitro*.**—*Parasitology* **48,** 463-467. [Author's summary modified.] **1030**

Immune sera that affected the motility of the trypanosomes also caused a decrease in oxygen uptake. Some trypanosomes appeared to be unaffected by the less active concentrations of immune sera, while other trypanosomes in the same suspension were clumped together or lysed. The most active serum inhibited oxygen uptake less at the highest concentration tested than at lower concentrations.

This technique was less sensitive than Soltys's method [*V.B.* **28,** 1402] for demonstrating neutralizing antibodies in the same sera.

WOHLLAIB, R. (1958). Über die Bedeutung des Follikelhormones für die Dauer der Trichomonadeninfektion beim Rind. **[Importance of oestradiol for the duration of trichomonas infection in cattle.]** — *Inaug. Diss., Munich* pp. 33. **1031**

Eight cows and a heifer were infected intravaginally with *Tr. foetus*. Six then received s/c 5,000,000 i.u. of oestradiol, and 3 were controls. *Tr. foetus* was demonstrated in the vaginal mucus for 47–122 days after infection in the treated cattle, and for 33–79 days in the controls. It is concluded from this experiment, and from similar experiments in rabbits and hamsters, that oestradiol has no inhibitory effect on *Tr. foetus* infection.—M.G.G.

JOYNER, L. P. (1959). **The effects of chlortetracycline on the development of *Eimeria tenella* in chicks.** — *Vet. Rec.* **71,** 43-46. [Author's summary modified.] **1032**

The coccidiostatic effects of chlortetracycline were studied. 0·08% of the antibiotic in the food gave complete control of the mortality due to *Eimeria tenella* provided it was administered at the time of infection. The same conc. in the drinking water did not give such complete protection and there was a marked reduction in efficacy when administration was delayed. The main effect appeared to be retardation of schizogony. Abnormal segmentation of 2nd generation schizonts was observed histologically.

SOLIMAN, K. N. (1958). ***Globidium gilruthi* (Chatton, 1910) infection in the digestive tract of sheep and goats in Egypt.**—*Parasitology* **48,** 291-292. [Author's summary modified.] **1033**

The occurrence of *Gl. gilruthi* in sheep and goats in Egypt was recorded. Preliminary investigations showed that 18% of 250 sheep and 28% of 150 goats were infected. The lesions were described.

KOLABSKII, N. A. & GAIDUKOV, A. K. (1957). **[Lowering the virulence of *Nuttalia equi*.]**—

Sborn. Rabot Leningrad. vet. Inst. No. 16 pp. 80-83. [In Russian.] **1034**

The piroplasm became attenuated after between 4 and 7 serial passages in horses. —R.M.

SEMENOVA, L. S. (1957). **[Comparison of pyraldin and haemosporidin for treatment and prophylaxis of piroplasmosis in cattle.]** —*Sborn. Trud. Leningrad. nauchno-issled. vet. Inst.* No. 7 pp. 107-115. [In Russian.] **1035**

S. confirmed the therapeutic efficacy of pyraldin [*V.B.* **27,** 3557] and haemosporidin [*V.B.* **27,** 437]. A single prophylactic s/c inj. of pyraldin (6 mg/kg. body wt.) reduced the severity of the disease if administered during the incubation period, but haemosporidin was of no prophylactic value.—R.M.

ZWART, D. (1959). Een onderzoek naar het voorkomen van bloedparasieten bij runderen te Merauke (Nederlands Nieuw-Guinea). **[Blood parasites of cattle in Dutch New Guinea.]**—*Tijdschr. Diergeneesk.* **84,** 90-99. [Summaries in English, French and German. English summary modified.] **1036**

In order to ascertain the blood parasites of cattle at Merauke (Dutch New Guinea), five splenectomized yearlings (imported from Holland) were injected with blood from indigenous cattle. In this way *Babesia bigemina* and *Anaplasma marginale* were demonstrated. Therapy consisted of s/c injection of quinuronium for piroplasmosis and of either i/v or i/m administration of aureomycin and i/v inj. of a mixture of ethyl alcohol and normal saline for anaplasmosis: 60 days later temperature and pulse had returned to normal; the animals were, however, very much emaciated.

As the cattle elsewhere in Dutch New Guinea also partly originate from Merauke, it may be assumed that *B. bigemina* and *A. marginale* will be enzootic wherever *Boophilus microplus* occurs.

VOGELSANG, E. G. & PIERETTI, R. V. (1957). Experiencias con el spirotripan "fuerte" en el tratamiento de la anaplasmosis bovina. **[Treatment of bovine anaplasmosis with "Spirotrypan".]** — *Rev. Med. vet., Caracas* **16,** 71-77. **1037**

Seven cases were treated by i/v inj. of 20 ml. of a soln. of the drug [*V.B.* **27,** 1083], repeated in some cases after 5 days. Prompt recovery was claimed.—R.M.

RYFF, J. F., GILBERT, C. S., WEIBEL, J. L. & BREEN, H. (1958). **Anaplasmosis and concurrent copper intoxication in sheep.** — *J. Amer. vet. med. Ass.* **133,** 312-315. **1038**

Seven ewes were obtained from a flock where chronic copper poisoning was suspected. The copper content of the livers varied between 96 and 540 p.p.m. Anaplasmosis was demonstrated also, by the presence of anaplasma bodies in the r.b.c. and by characteristic blood changes after splenectomy and inoculation of blood into experimental sheep.—M.G.G .

ANGELOFF, S., GALABOFF, S., GIGOFF, A. & NIKOLOFF, P. (1957). Untersuchungen über die Toxoplasmose in Bulgarien. **[Research on toxoplasmosis in Bulgaria.]**—*C. R. Acad. bulg. Sci.* **10,** 329-332. [In German. Summary in Russian.] **1039**

Random serological tests for toxoplasmosis were carried out in man and domestic animals in Bulgaria. Using Frenkel's allergic test, the authors examined 138 sheep, 114 cattle, 111 goats, 45 dogs and 13 horses, of which 28 goats, six dogs, five cattle, four sheep and one horse reacted positively. In addition six dogs, four goats, three sheep and one cow yielded positive c.f. reactions. Details were also given of serological reactions in human patients suffering from eye diseases, psychoneurological disorders and repeated abortion.—E.G.

MALHERBE, H. & MUNDAY, V. (1958). ***Encephalitozoon cuniculi* infection of laboratory rabbits and mice in South Africa.**—*J. S. Afr. vet. med. Ass.* **29,** 241-246. [Authors' summary modified.] **1040**

The occurrence of *Encephalitozoon cuniculi* in laboratory rabbits and mice in South Africa is reported. 43 of 51 rabbits from one breeding colony had typical lesions of the brain or kidney, and brain lesions were observed in one out of 60 uninoculated white mice. Organisms with the morphological and staining characteristics of *E. cuniculi* were seen in sections of both rabbit and mouse tissues. Infection with this parasite should be borne in mind when rodents are inoculated with material thought to contain neurotropic agents.

See also abst. **1266** (book, plasmodium).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

BROWN, F. (1958). **Immunoelectrophoretic evidence for the presence of two precipitating antibodies in serum following infection with the virus of foot-and-mouth disease.** — *Nature, Lond.* **181,** 1130-1131. **1041**

Application of the immuno-electrophoretic technique of Graber & Williams (1953) to serum of g.pigs recovering from F. & M. disease confirmed the presence of two distinct antibodies [*V.B.* **28,** 2464].—R.M.

GEIGER, W. & OTTE, B. (1958). Die serologische Typendiagnose der Maul- und Klauenseuche des Schweines. **[Serological typing of foot and mouth disease of pigs.]**—*Dtsch. tierärztl. Wschr.* **65,** 344-346. [Summary in English.] **1042**

Of 518 samples of material from pigs with F. & M. disease, Type C was identified in 278, Type A in 44, Type O in 25, and 171 were negative or doubtful. Fresh vesicles from the feet and snout gave the best results.—M.G.G.

KOBUSIEWICZ, T. (1958). Le vaccin chinosolé contre la fièvre aphteuse. **[A chinosol vaccine against foot and mouth disease.]**—*Bull. Off. int. Epiz.* **49,** 84-86. **1043**

The vaccine contains 3% antigen, 0·1% chinosol, 0·5% formol and 15% glycerol. The antigen is not filtered but thoroughly ground; this reduces cost of production. The chinosol and formol inactivate the virus and destroy bacteria, while the glycerol acts as a preservative. It is stated that the vaccine retains its efficacy for one month at 17° to 22°C. Dosage is 5 ml. per 300 kg. Laboratory experiments show that the vaccine protects cattle against 100,000 LD_{50} of virus for 5 months and the chinosol and formol completely destroy *M. tuberculosis* and brucella, possible contaminants when the virus is grown on tongue epithelium of slaughter cattle. [See also *V.B.* **28,** 3565].—T.E.G.R.

DHANDA, M. R., GOPALAKRISHNAN, V. R. & DHILLON, H. S. (1957). **Studies on foot-and-mouth disease vaccination in India. II. A concentrated crystal violet vaccine.**—*Indian J. vet. Sci.* **27,** 127-132. **1044**

A concentrated vaccine, in which the tongue epithelium content was raised to 15%, conferred adequate immunity lasting for nearly 18 months when injected into cattle in doses of 5 ml. In a natural outbreak of the disease in a herd, only 2 of 236 cattle vaccinated $2\frac{1}{2}$ months earlier became affected as against 210 of the 400 left unvaccinated.—R. N. MOHAN.

WEYL, A. (1958). Beobachtungen über Immunitätswirkung bei Schutzimpfungen von Rindern gegen Maul- und Klauenseuche im Lande Niedersachsen. **[Efficacy of prophylactic immunization against foot and mouth disease in Lower Saxony.]**—*Dtsch. tierärztl. Wschr.* **65,** 377. [Summary in English.] **1045**

Of 1,419,313 cattle vaccinated with Waldmann's trivalent vaccine, only 292 (0·02%) developed F. & M. disease within 18 days after vaccination and a further 25 within 18 months. —M.G.G.

UHLMANN, W. & TRAUB, E. (1958). Versuche zur Prüfung von Maul-und-Klauenseuche-Vakzinen an erwachsenen Mäusen. **[Testing foot and mouth disease vaccines on adult mice.]**—*Mh. Tierheilk.* **10,** 105-112. **1046**

Adult mice were vaccinated s/c against F. & M. disease and after 3 weeks inoculated i/p with virus. Most remained free from viraemia, whereas unvaccinated controls almost invariably developed a viraemia which reached its peak in 24 hours and then declined. By means of this mouse test 2 commercial vaccines of different antigen content could be distinguished.—M.G.G.

NACHKOV, D., CRISTOPHOROV, L., GUÉNEV, C. & STOYANOV, V. (1958). La réaction de fixation du complément dans la maladie d'Aujeszky chez les porcs. **[The complement-fixation test in Aujeszky's disease.]**—*Bull. Off. int. Epiz.* **49,** 383-388. **1047**

Sera from 530 pigs on 16 farms infected with Aujeszky's disease were submitted to the c.f. test, using antigen prepared from infected rabbit brains. The proportion of reacting sera varied between 50% and 70%. Reactions were most pronounced 20–25 days after onset of the outbreaks. The antigen was specific and did not react with hyperimmune sera against swine fever, swine pox, *Salmonella, Pasteurella,* or *Brucella* infections, or human influenza, nor did it react with 588 normal horse sera and 2,616 normal pig sera. It is concluded that the test would be useful in distinguishing outbreaks of Aujeszky's disease from those of influenza and virus pneumonia.—M.G.G.

LUKASHOV, I. I. & NIKITINA, V. S. (1958). **[Prophylactic and therapeutic properties of gamma globulin in Aujeszky's disease.]**—*Veterinariya, Moscow* **35,** No. 9 pp. 48-50. **1048**

Gamma globulin was prepared from

Aujeszky's disease immune serum, and was employed as a 10% soln. in water. After some experiments on artificially infected pigs, the preparation was tried in field outbreaks: 89 piglets in direct contact with infected pigs were each inoculated with 2 or 4 ml. and 36 subsequently developed the disease. Of 128 treated pigs on infected farms but not in direct contact, only 3 became infected. Therapeutically, half the pigs treated with 4 ml. recovered, while 82% of pigs treated with 8 ml. recovered.—R.M.

Verge, J., Saurat, P., Lautié, R. & Goulard, G. (1958). Sur l'actuelle enzootie de rage, dans le Sud-Ouest. [**Rabies situation in south-western France.**]—*Rev. Méd. vét.* **109,** 497-508. [Summaries in English and Spanish.] **1049**

After an absence of over 20 years, rabies broke out in France in the south-west in early 1956 and spread to 3 Departments. The disease was first diagnosed in a stray dog, and by June, 1958, 120 cases had been diagnosed in domestic animals, chiefly dogs and cattle. Rabies was not demonstrated in 14 foxes from an affected district. The number of cases decreased in 1958, thanks to the policy of killing stray dogs.
—M.G.G.

Schindler, R. & Dennig, H. K. (1958). Untersuchungen über die Bedeutung der Fledermäuse für den gegenwärtigen Tollwut-Seuchenzug in Deutschland. [**Importance of bats in the spread of rabies in Germany.**]—*Mh. Tierheilk.* **10,** 169-177. **1050**

The brains of 92 *Myotis myotis* insectivorous bats were examined for rabies virus by intracerebral inoculation of mice. All were negative. But in blood tests rabies virus was neutralized by the sera of 8. Four bats were inoculated intracerebrally with 2 LD_{50} of street virus; one developed rabies, but this was considered due to transmission from a bat in the same cage infected with fixed virus. Twelve of 15 bats developed rabies after intracerebral inoculation of 200 LD_{50} of street virus; Negri bodies were demonstrated only in one, and the virus was isolated from the salivary glands in only one of 11. Fixed virus (5 LD_{50}) was injected intracerebrally into 2 bats; both developed rabies. Of 14 bats infected with street virus intramuscularly, only 2 developed rabies. Infected bats were allowed to bite 60 mice, but transmission was not established. It is concluded that bats do not play a role in the spread of rabies in Europe, but might act as a reservoir.—M.G.G.

Porzecanski, B. (1958). El control de la rabia en el Uruguay. [**Control of rabies in Uruguay.**]—*Bol. Ofic. sanit. pan-amer.* **44,** 199-202. **1051**

As a result of control measures which included catching and destruction of unclaimed stray dogs and vaccination of those claimed by their owners, Uruguay has been completely free from rabies since 1950.—E.G.

Falchetti, M. & Mérieux, J. (1958). Titrage sur lapins et sur cultures de tissus des anticorps neutralisants de sérums et de laits de vaches immunisées par le virus de la vaccine. [**Titration in rabbit and tissue culture of neutralizing antibodies in serum and milk from cows immunized with vaccinia virus.**]—*Rev. Path. gén.* **58,** 399-403. **1052**

Neutralizing antibodies were demonstrated in the serum and milk of 2 cows immunized with vaccinia virus, by titration on the scarified skin of rabbits and in HeLa tissue cultures. Tissue culture was the more sensitive method.
—M.G.G.

Mérieux, C. (1958). Perspectives nouvelles de la lacto-prophylaxie des maladies infectieuses par l'emploi chez l'enfant de lait obtenu sur des vaches immunisées. [**Prophylaxis of infectious diseases by giving children milk from immunized cows.**]—*Rev. Path. gén.* **58,** 405-406. [Summaries in English and Spanish.] **1053**

Commenting on the article by Falchetti & Mérieux [see preceding abst.], M. hopes that drinking milk from immunized cows will eventually replace inoculation in preventing children's diseases such as whooping-cough and variola.
—M.G.G.

Yuan Ching-tze, Lee Pao-chi & Cheng Yuin-shian (1957). [**Research on the low virulent virus vaccine of sheep pox. I. Cultivation of sheep pox virus on the developing chick embryo.**]—*Acta vet. zootech. sinica* **2,** 15-24. [In Chinese. English summary modified.] **1054**

The authors tried to cultivate the virulent Tai-yuan strain of sheep pox virus on the chorio-allantoic membrane of the chick embryo. Further successive passages were possible only after the virus had been transferred back to the sheep skin after the third successive passage on the membrane. The virulence of the virus was remarkably reduced after 90 successive passages, while its good antigenic property was still retained. Thus it was possible to use it for vaccine production.

CILLI, V. & BALDELLI, B. (1958). Aspetti morfologici di cellule testicolari di *ovis aries* coltivate in vitro e infettate con virus del vaiolo ovino. [**Effect of sheep pox virus on ovine testicular cells cultured** *in vitro*.]—*Sperimentale* **108,** 91-109. **1055**

A detailed account, with plates (some coloured), of work already published [see *V.B.* **28,** 3946].—T.E.G.R.

SMITHBURN, K. C. (1958). **Problems of the arthropod-borne viruses in Africa.**—*Ann. Soc. belge Méd. trop.* **38,** 347-358. **1056**

Tables are presented of viruses in Africa considered to be arthropod-borne and pathogenic for man, mosquito species implicated as vectors, mosquito-borne viruses isolated in Tongaland in 1955, and the incidence of immunity to 2 such viruses in human beings, cattle, sheep and goats in Tongaland. The influences of climate and vegetation are discussed. Control is very difficult and is not expected to be accomplished yet either by vaccination, or by vector control, or by treatment.—M.G.G.

DANEŠ, L. & KIMERLINGOVÁ, M. (1958). **Natural foci of the Western type of North American equine encephalomyelitis** (WEE) **in Czechoslovakia. VI. A fatal case of infection by the WEE virus in man.**—*Acta Virol., Prague* **2,** 32-40. [In English.] **1057**

Antigenic and biological properties of a virus, isolated from the brain of a young man who had died from a non-purulent form of encephalomyelitis, resembled those of the viruses WEE-Cg and WEE-15. The source of infection was not established.—E.G.

HIDIROGLOU, M. & PREVOST, R. (1957). Effets de l'hydrazide de l'acide iso-nicotinique sur l'encephalomyelite sporadique des bovins en Guyane Française. [**Action of isoniazid on bovine sporadic encephalomyelitis in French Guiana.**]—*Rev. Med. vet., Caracas* **16,** 53-55. [In French.] **1058**

Four cattle aged 6–18 months with encephalomyelitis were given 3 i/m injections of 1·25 g. isoniazid as a 5% soln. with intervals of 3 days between injections. In each case symptoms disappeared by the tenth day of treatment. Other treatments (sulphadimidine, chloramphenicol, streptomycin, vitamins) failed to influence the course of the disease.—R.M.

KISSLING, R. E. (1958). **Eastern equine encephalomyelitis in pheasants.**—*J. Amer. vet. med. Ass.* **132,** 466-468. **1059**

Laboratory diagnosis, isolation and identification of the virus, epidemiology and control of the disease are discussed. Immunization is considered more logical than mosquito control, since the disease may spread by contact in the absence of mosquitoes. Results of a small experiment with a chick embryo formolized vaccine indicated that some protection was engendered. —T.E.G.R.

SOVINOVÁ, O., TOMOVÁ, B., POUSKA, F. & NĚMEC, J. (1958). **Isolation of virus causing respiratory disease in horses.**—*Acta virol., Prague* **2,** 52-61. [In English.] **1060**

During an epidemic of respiratory infection in Czechoslovakia in 1956, 230 serum samples from infected, convalescent and healthy horses were examined by complement fixation against human influenza antigen, and influenza A antibodies were demonstrated in convalescents. High antibody titres were also demonstrated by c.f. and haemagglutination-inhibition against a virus, antigenically resembling type A virus, which was isolated from nasal washings of an infected horse.—E.G.

MORNET, P. & GILBERT, Y. (1958). Les méthodes actuelles de lutte contre la peste bovine. [**Modern methods in the control of rinderpest. A review.**]—*Cah. Méd. vét.* **27,** 133-164 & 165-204. **1061**

This is an excellent and up-to-date account of what is still potentially the greatest disease hazard of cattle. It will be most useful not only to workers in countries where rinderpest still persists but also to those in other countries who have the duty of taking measures to prevent invasion.

The subject is dealt with under the following heads. (1) A summary of the present distribution of rinderpest throughout the world; (2) Prevention by veterinary police measures; (3) Prophylaxis by use of biological products; (4) A discussion of the methods of control. Section 3 is the longest and deals with immune serum (very briefly); inactivated vaccines; attenuated vaccines, namely the goat, rabbit and chick embryo vaccines; recent work on tissue culture of the virus; and mention of the recent findings indicating cross immunity between the rinderpest virus and that of dog distemper.

A most useful list of references completes this first class piece of work.

DHANDA, M. R. & MENON, M. S. (1958). **Rinderpest and its control. Latest position with regard to vaccines employed.**—*Indian vet. J.* **35,** 214-219. **1062**

A brief résumé of up-to-date experience of

the caprinized, lapinized, and lapinized-avianized strains of rinderpest virus and their comparative usefulness for immunizing animals of different degrees of susceptibility.

—R. N. Mohan.

Mornet, P., Gilbert, Y. & Mahou, R. (1958). Prophylaxie de la peste bovine. Nouvelle méthode économique de préparation du virus-vaccin bovipestique caprinisé sur boeuf réagissant. [**Use of reacting cattle for production of rinderpest caprinized virus vaccine.**]—*Bull. Off. Int. Epiz.* **49,** 274-288. [First published in *Rev. Elev.* (1957). **10,** 333-340.] **1063**

For the large-scale production of rinderpest vaccine calves are considered more economical than goats, of which large numbers are required. A calf is inoculated with 250,000 m.l.d. goat-adapted virus. Blood smears are examined for protozoan parasites at the height of the thermal reaction on the fourth and fifth days. The animal is then killed and 1–1·5 l. of blood is collected and defibrinated. The spleen and all the lymph nodes are removed, minced and weighed. An equal quantity of blood (vol./wt.) is added to the tissue and the mixture is ground without heating and strained through sterile gauze. This is then put into ampoules in quantities of 1 ml. each; the vaccine is freeze-dried, the ampoules are sealed under vacuum and stored at −20°C.—T.E.G.R.

Lin-Peng, C. (1957). [**An experiment on the preservation of the lapinized rinderpest virus in the low temperature storage cabinet.**]—*Acta vet. zootech. sinica* **2,** 73-76. [In Chinese. English summary modified.] **1064**

Lapinized rinderpest virus maintained its viability for about 20 days in rabbit lymph nodes and in blood and spleens for about 10 days at 0° to 4°C. In the frozen state at −17° to −20°C., the lymph node virus maintained its full virulence for at least 180–240 days, the spleen virus maintained it for about 90 days, and the blood virus for about 15 days. In the frozen state the titre of the blood virus decreased to 10^{-1} dilution as measured by rabbit inoculation 10 days after preservation, but the titre of the spleen virus after 30 days', and that of the lymph node virus after 90 days' preservation, were still as high as 10^{-5}, being only slightly lower that the original titres.

When specimens were stored at −17° to −20°C., the viability and the titre of the lapinized rinderpest virus varied in each test; it was especially so for the blood virus. These variations may be attributed to the fact that the amount of virus in the same tissues of different rabbits is different, and that the temperature of the cabinet is not always constant during the period of preservation.

For maintenance of stock virus, it is advisable to store the lymph node or spleen virus at −17° to −20°C. and to inoculate rabbits with the frozen samples at intervals of 2·5–3 months.

Reinders, J. S. (1959). Virusdiarree bij runderen. [**Virus diarrhoea in cattle.**]—*Tijdschr. Diergeneesk.* **84,** 81-89. [Summaries in English, French and German.] **1065**

R. described 8 sporadic outbreaks of a mucosal disease observed in Friesland between October 1956 and May 1958. In most of the outbreaks small numbers of cattle, mostly yearlings, were involved. One practitioner had reported 19 fatal cases of diarrhoea within 6 weeks. Lesions consisted of erosions throughout the alimentary tract [6 colour photographs], similar to those of the mucosal disease complex as described in the U.S.A. and U.K. Virus studies are being done at the State Veterinary Research Institute in Amsterdam.—R.M.

Kendrick, J. W., Gillespie, J. H. & McEntee, K. (1958). **Infectious pustular vulvovaginitis of cattle.**—*Cornell Vet.* **48,** 458-495. [Authors' summary modified.] **1066**

The authors examined a herd during an outbreak of infectious pustular vulvovaginitis. From samples of vaginal exudate a virus was cultivated in tissue culture. All 19 heifers inoculated with tissue-cultured virus developed disease that resembled the naturally occurring condition. Small foci of necrosis developed in the vulva and vagina and the resulting influx of neutrophiles produced pustules characteristic of the disease. Coalescence of the pustules may produce large ulcers covered with exudate. There was a febrile response and a decrease in the number of neutrophiles in the blood. The virus was shed in the vaginal exudate during the acute phase and neutralizing antibody appeared in the blood in about 2 weeks. Histologically the degeneration of the epithelial cells was characterized by the formation of intranuclear inclusions.

Hunter, A. G., Henderson, B. W. Jr. & Dardiri, A. H. (1958). **Granular vulvovaginitis: a review.**—*J. Dairy Sci.* **41,** 1024-1032. **1067**

A factual review of the literature on granular vulvovaginitis (listing 95 references) illustrating the confused state of knowledge on

most aspects of the disease, including the experimental work on the aetiology and on treatment. No new work is reported.—F.E.W.

McCRORY, B. R., BAY, R. C. & FOSTER, N. M. (1958). **Observations on bluetongue in sheep.**—*Proc. 61st Ann. Meet. U.S. live Stk sanit. Ass., St. Louis*, pp. 271-275. **1068**

Bluetongue was probably first recorded in the U.S.A. in 1947, and in 1952 the Agricultural Research Service created a bluetongue laboratory at Denver, Colorado. At this lab., the virus was identified by inoculation of sheep with blood from 48 of 100 suspected flocks in 12 States. Losses were less severe in well-fed flocks than in those on dry or barren ranges. The virus had not yet been isolated at this lab. from cattle. —R.M.

BELONJE, C. W. A. (1958). **Field observations on Wesselsbron disease.**—*J. S. Afr. vet. med. Ass.* **29**, 1-12. **1069**

A disease characterized by widespread haemorrhages and jaundice killed about 1,500 of 65,000 sheep in one river valley between February and April of 1957: the same disease occurred in the same area in 1956. B. described five clinical forms. Wesselsbron virus was isolated from the blood of affected sheep. Sera from a horse and from cows in a herd where abortions had occurred (but no sheep lost) gave positive neutralization tests with this virus. The author developed an illness diagnosed as infectious hepatitis about 10 days after P.M. examination of affected sheep. Flocks were sprayed with insecticides in an attempt to destroy arthropod vectors. To distinguish the condition from toxaemic jaundice (copper poisoning) the copper content of liver from 15 cases was determined: 13 contained normal amounts but in 2 cases there was excess Cu (920 and 1,500 p.p.m.).—R.M.

SCHOENING, H. W. (1958). **Some observations on hog cholera and its control in the United States.**—*J. Amer. vet. med. Ass.* **133**, 401-404. **1070**

The history of swine fever and its control in the U.S.A. are reviewed. Since the introduction of the modified live virus vaccines in 1951, there has been a steady increase in their use and a corresponding decrease in the use of virulent virus and immune serum. In 1956 modified live virus accounted for 71% of vaccinations, virulent virus and immune serum for 24%, and inactivated virus for 5%. Several States prohibited the use of virulent virus and now report a decreased incidence of swine fever. In 46 States swill fed to pigs must be cooked.—M.G.G.

ANON. (1958). **Anti-hog cholera serum—an adequate reserve needed.**—*J. Amer. vet. med. Ass.* **133**, 439. **1071**

In the U.S.A. each manufacturer of immune serum against swine fever is required to hold in stock, on an agreed date between Jan. 1st and May 1st, a quantity of serum equal to 40% of what he supplied in the previous year. But the shrinking demand for immune serum against swine fever means that this reserve of 40% would no longer be adequate to meet the demands of a widespread epidemic. It is considered that a reserve of more than 40% of the previous year's production is needed, and the manufacturer must be indemnified by the government against financial loss.—M.G.G.

CAMPBELL, C. L. (1958). **The field use of modified virus vaccine.**—*Proc.* 61st *Ann. Meet. U.S. live Stk sanit. Ass., St. Louis*, 1957. pp. 276-281. **1072**

G. discussed experience with modified swine fever virus vaccines in Florida. In three years (1954/57) just over a million pigs were immunized and 70% of them received modified virus. Immunization with virulent virus and serum has now been discontinued. As a trial all pigs in one county (40,700) were immunized. Of the 439 deaths from swine fever in Florida during the same year, none occurred in this county. A Hog Cholera Research Station was set up at Live Oak and one of its functions is to compare the immunizing value of different vaccines.—R.M.

SAKANYAN, S. S. (1956). [**Influence of caffeine on development of post-vaccinal immunity in swine fever.**]—*Trud. Armyan. nauchno-issled. Inst. Zhivotnovodstva i Veterinarii* **1**, Ser. Vet. No. 9. pp. 25-34. [In Russian.] **1073**

Caffeine (0·5 ml. of a 20% soln.) was injected s/c 10–15 min. before inoculation of crystal violet swine fever vaccine. It was claimed that stimulation of the cerebral cortex by caffeine led to more rapid establishment of post-vaccinal immunity, so that the dose of vaccine could be reduced from 15 to 10 ml. The phenomenon did not occur if caffeine was injected at the same time as the vaccine.—R.M.

JUŚKO-GRUNDBOECK, J. & ŻEBROWSKI, L. (1958). Zmiany w poziomie frakcji białkowych surowicy świń zachodzące w procesie uodparniania szczepionką przeciw pomorowi z fioletem krystalicznym. [**Changes in serum protein fraction levels in pigs immunized against swine fever with crystal violet vac-**

cine.]—*Méd. vét., Varsovie* **14,** 385-388. [In Polish. Summaries in English and Russian.] **1074**

Three lots of serum samples were taken from 7 pigs; the first before, and the second and third 2 weeks after each of the 2 doses of crystal violet vaccine. Gradual rise in total nitrogen, fall in non-protein nitrogen and an increase in α and β globulins were noted. The serum protein fraction level rose within 2 weeks after the first dose and fell within 2 weeks after the second.—M. GITTER.

HANSON, R. P. & KARSTAD, L. (1958). **Further studies on enzootic vesicular stomatitis.**—*Proc. 61st. Ann. Meet. U.S. live Stk sanit. Ass., St. Louis,* 1957. pp. 300-307. [For previous studies see *V.B.* **28,** 2124.] **1075**

A serological survey of pigs in South Carolina and Georgia was carried out and the results are shown on maps. 30% of human sera received at a public health lab. in Georgia contained neutralizing antibodies abainst the New Jersey type of virus. Attempts to isolate the virus from a wide variety of animals other than cattle and pigs failed. Deer and raccoon developed acute and brief infections experimentally; they did not remain carriers. The virus was inactivated quite rapidly in earthworms but it persisted for up to 5 weeks in frogs. Incidence of the disease was studied in wild pigs on a small peninsula, fenced off from the mainland.—R.M.

FARRELL, R. K., OTT, R. L. & GORHAM, J. R. (1958). **The failure of egg-propagated distemper virus to interfere with experimental neurotropic distemper in mink.**—*J. Amer. vet. med. Ass.* **133,** 269-270. [Authors' summary.] **1076**

Egg-propagated distemper virus given to mink by the intracerebral route, nine days after subcutaneous virulent virus exposure, did not interfere with the production of neurotropic signs or mortality.

CABASSO, V. J., STEBBINS, M. R. & AVAMPATO, J. M. (1958). **A bivalent live virus vaccine against canine distemper (CD) and infectious canine hepatitis (ICH).**—*Proc. Soc. exp. Biol., N.Y.* **99,** 46-51. [Authors' summary modified.] **1077**

The virulence of the virus of infectious canine hepatitis was effectively modified by serial propagation in dog kidney cultures followed by adaptation to and serial cultivation in porcine embryo tissue. The modified virus was an effective immunizing agent, and produced in the vaccinated animal no adverse reaction except for an occasional slight and transient opacity of the eye. The modified ICH virus may spread through the urine of vaccinated dogs to others in close contact, but although these developed antibodies they showed no signs of disease. A combined vaccine prepared by mixing modified dog distemper and ICH viruses elicited good protection against both diseases in doubly susceptible animals, and in puppies already immune to ICH did not interfere with the production of immunity to distemper.

SÁLYI, J. & KAPP, P. (1958). Pathohistologische Veränderungen im Gehirn der mit dem Virus der ansteckenden Leberentzündung künstlich krankgemachten Hunde. [**Brain lesions in dogs following experimental infection with virus hepatitis.**]—*Mh. VetMed.* **13,** 242-245. **1078**

Lesions histologically similar to those occurring in fox encephalitis were found in 13 dogs which died 4–7 days after experimental parenteral infection with the virus.—R.M.

MOULDER, J. W., RUDA, J., COLÓN, J. I. & GREENLAND, R. M. (1958). **The effect of passage with chloramphenicol upon the behavior of penicillin-resistant feline pneumonitis virus during subsequent passage with penicillin.**—*J. infect. Dis.* **102,** 186-201. **1079**

A penicillin-resistant strain of feline pneumonitis virus (obtained by serial passage in chick embryo treated with penicillin) did not form haemagglutinins in the allantoic cavity and its antiserum did not neutralize the parent strain. It retained its properties from the 33rd to the 56th passage in the presence of penicillin. On two separate occasions it was passaged 5 times, without loss of resistance, in chick embryos treated with chloramphenicol. However, on subsequent serial passage in the presence of penicillin new changes in virus properties were observed in 8 of 9 trials. In two series increased susceptibility was observed: one strain regained resistance after one passage in the absence of drugs; the other was fully susceptible and remained so during repeated passage in the absence of drugs. In 6 series there was a change in resistance, death of the embryos occurring over a period of 5–10 days instead of 1–2 days. These strains differed from the normal virus in that they were completely resistant to penicillin, grew to a lower terminal titre, were not neutralized by antiserum against either the parent strain or the normal resistant strain, and showed cross-resistance to chloramphenicol. All the strains except one were stable during passage in the absence of drugs. Penicillin-susceptible

strains and variants of the penicillin-resistant virus occurred only when the normal resistant virus was passaged first with chloramphenicol and then with penicillin. The role of chloramphenicol in the production of variants is discussed.—T.E.G.R.

VON BARGEN, G. (1958). Geschlechtsgebundene Unterschiede in der Reaktion auf Shope-Virus-Infektionen bei Hauskaninchen. [**Sex linked differences in the reaction of rabbits to Shope virus infection.**]—*Arch. ges. Virusforsch.* **8,** 216-220. **1080**

Female rabbits were more susceptible to Shope's papilloma than males. This was explained by the thinner skin and higher tissue permeability in does. The cause of this sex difference has not been established, but in mice thickness of the skin appeared to be influenced by sex hormones [*V.B.* **21,** 3359].—E.G.

POLLARD, M. (1958). **Comparative studies on viral hepatitis in animals and in man.**—*Ann. N.Y. Acad. Sci.* **70,** 383-390. **1081**

An increase in the histiocyte count in the chorioallantoic fluid of 7-day-old embryonated eggs was observed 4 hours after inoculation of preparations of homogenized pooled livers from mice acutely infected with murine hepatitis virus (MHV). MHV disappeared rapidly from cultures of mouse fibroblasts and liver tissue, but survived for 25 hours in minced mouse kidney tissue. Complement-fixing antigen could be prepared by ultracentrifugal methods from MHV infected livers.—A. ACKROYD.

WILSON, D. E. (1958). **The inactivation of Newcastle disease virus hemolysin by antiserum and high-energy electrons.**—*Proc. Soc. exp. Biol., N.Y.* **99,** 205-208. [Author's summary modified.] **1082**

The NDV haemolysin was shown to be inactivated by a single antibody molecule per virus particle. Electron irradiation of NDV indicated that rate of haemolysis of r.b.c. depends on number of intact haemolysin units per virus particle, whereas ability to lyse r.b.c., given sufficient time, depends on the presence of only a single intact haemolysin unit per virus particle.

GEHRING, K. & GEISS, E. (1958). Ein Verfahren zur quantitativen Wertbemessung von Geflügelpestimpfstoffen. [**Method for quantitative evaluation of Newcastle disease vaccines.**]—*Mh. Tierheilk.* **10,** 123-156. **1083**

Chicks, 14 days old, were vaccinated with graded doses of the vaccines to be tested and challenged two weeks later with 10^6I.D. of virulent Newcastle disease virus. The dose which protected 50% of chicks for seven days after test infection was calculated from the relationship between the survival rate and the log. of the vaccine dose used.—E.G.

GAVEZ, E. (1958). Reducirani intenzitetni izražji intestinalnog difteroida Newcastle—bolesti u toku koegzistentne tenijaze. [**Effect of tapeworm infestation on intestinal lesions in fowls, simultaneously infected with Newcastle disease.**]—*Veterinaria, Sarajevo* **7,** 57-60. [In Croat. Summaries in English and German.] **1084**

In the course of examination of fowls with simultaneous Newcastle disease and tapeworm infestation, it was observed that the formation of diphtheritic intestinal lesions of Newcastle disease appeared to be inhibited by simultaneous tapeworm infestation.—E.G.

HITCHNER, S. B., SHEA, C. A. & WHITE, P. G. (1958). **Studies on a serum neutralization test for the diagnosis of laryngotracheitis in chickens.**—*Avian Diseases* **2,** 258-269. [Authors' summary modified.] **1085**

A serum neutralization (SN) test with laryngotracheitis virus, employing a dropped chorio-allantoic membrane inoculation technique and calculating the EID_{50} end-points is described.

A frozen virus suspension was stable when held at −40°C. for three months.

Untreated and heat-inactivated serums showed no marked differences in the SN titres.

Holding the serum–virus mixtures at room temp. for at least one hour resulted in maximum neutralization. The use of serum diluted 1:2 or 1:5 gave SN titres comparable to undiluted serum after correction for the dilution. Pools of serum gave SN titres comparable to mean titre of the individual samples. Virus-neutralizing antibodies were detectable one week after vaccination and reached their maximum by the third week.

The test rarely detected ten or more neutralizing doses in serum from birds susceptible to the infection.

I. BONAR, R. A., BEAUDREAU, G. S., SHARP, D. G., BEARD, D. & BEARD, J. W. (1957). **Virus of avian erythroblastosis. V. Adenosinetriphosphatase activity of blood plasma from chickens with the disease.**—*J. nat. Cancer Inst.* **19,** 909-922. **1086**

II. Beard, D. & Beard, J. W. (1957). **Virus of avian erythroblastosis VI. Further studies on neutralization by antiserum to normal chicken protein.**—*Ibid.* 923-939. **1087**

I. The plasma of chicks with erythroblastosis had slightly greater adenosinetriphosphatase activity than that of normal chicks. About half the activity was in plasma constituents too small for sedimentation in centrifugal fields which eliminated the virus and other particles visible by electron micrography. A smaller amount of activity was observed in particles smaller than the virus. The remainder was in the fraction containing the virus particles. The specific adenosinetriphosphatase activity of the virus, calculated by direct particle counts, was such that an average of 0·08 μg. phosphorus was liberated per min. per 10^{10} virus particles sedimented in 2 cycles of ultracentrifugal fractionation. This activity, compared with that of the myeloblastosis virus (2·86 μg. P/10^{10} particles per min.), is considered to be of little significance. There was no evidence that it was unequivocally associated with the erythroblastosis virus.

II. The virus was neutralized by serum of immune chicks and by antibodies produced in the rabbit by injection with normal chick serum or saline suspensions of ground normal chicken liver and spleen. Neutralization occurred *in vitro* when serum and virus were mixed in proper proportions and incubated, and was not dependent on complement. It did not occur *in vivo* when serum was injected i/v after or immediately before the virus. The action of the immune serum was not affected by dilution of the incubated mixture shortly before inoculation. These results and those of previous work are taken to indicate that the effect of the serum is on the virus particle. They also suggest that a substance antigenically like host material is a constituent part of the erythroblastosis virus particle. Differences in behaviour of the virus of erythroblastosis and of Rous sarcoma are discussed.—T.E.G.R.

Benedict, A. A. & McFarland, C. (1958). **Newer methods for detection of avian ornithosis.**—*Ann. N.Y. Acad. Sci.* **70,** 501-515. **1088**

The development of the direct complement fixation (DCF) and allergic tests for the detection of psittacosis is reported. DCF could be achieved with unheated, kaolin-adsorbed turkey and fowl antisera using as antigen, viral suspensions or a detergent extract of soluble psittacosis complement-fixing antigen, and with heat-inactivated turkey antisera using as antigen the detergent extract or its phenol-insoluble fraction. Complement could not be fixed directly with heat-inactivated fowl antisera using the detergent extract although this antigen combined with heated fowl antibody to give an indirect complement fixation (ICF), nor with heat inactivated turkey antisera using viral suspensions or the phenol-soluble fraction of the detergent extract antigen. The DCF test using the detergent extract and heat-inactivated sera showed an 88·5% agreement with the ICF test in 203 turkeys, whilst the DCF using unheated, kaolin-adsorbed sera was as sensitive as the ICF test in detecting serological reactors in orally infected chickens. Intradermal and serological tests in turkeys showed a 76–85% agreement, but the intradermal test, although suitable for mass surveys, is not suitable for diagnostic purposes.—A. Ackroyd.

Stewart, R. B. (1958). **The effect of cortisone on the lethality of psittacosis virus for the chick embryo.**—*J. infect. Dis.* **103,** 129-134. [Author's summary modified.] **1089**

Administration of cortisone with psittacosis virus to embryonated hens' eggs *via* the yolk sac delayed the death of the embryos. The degree of protection depended on the relative concentrations of virus and steroid. Cortisone had no *in vitro* effect on the virus.

Maral, R. & Ciaccio, G. (1958). Action de la spiramycine (5·337 R.P.) sur l'infection de la souris par l'agent de la psittacose et sur le développement de la psittacose dans l'embryon de poulet. **[Inhibitory action of spiramycin on psittacosis infection of mice and chick embryos.]**—*C. R. Soc. Biol., Paris* **152,** 49-52. **1090**

Spiramycin inhibited the development of psittacosis at least as well as chlortetracycline. Of 95 chick embryos that received 1 mg. of spiramycin in the yolk one hour before 1,000 LD_{50} of psittacosis virus 67 survived, compared with 22 of 97 untreated controls. Of 85 mice that received orally 10 mg. per 20 g. body wt. one hour before i/p infection and once daily thereafter 68 survived, compared with 7 of 86 untreated controls.—M.G.G.

Strauch, D. & Rott, R. (1958). Vergleichende Untersuchungen über die Isolierung des Psittakosevirus aus Wellensittichen mit Hilfe des Mäuseversuches und der Züchtung im embryonierten Hühnerei. **[Isolation of psittacosis virus from budgerigars, using mice and cultivation in chick embryos.]** — *Z. Hyg. InfektKr.* **145,** 5-18. **1091**

Suspensions of spleen and liver from 101 budgerigars were inoculated into the peritoneum of mice and into the allantoic cavity of embryonated hens' eggs. Smears from the liver and spleen of mice or allantoic and amniotic fluid from eggs were examined microscopically for elementary bodies. Psittacosis was diagnosed in 29 budgerigars by egg inoculation and in only 10 by mouse inoculation. The complement-fixation test was not sufficiently reliable for use on individual birds but it could be used for screening populations.—R.M.

BEER, J. (1958). Der Stand unserer derzeitigen Kenntnisse über virusbedingte Embryo- und Fetopathien. **[Virus diseases of embryos and foetuses.]** — *Zuchthyg. FortpflStörung. u. Besamung* **2,** 164-178. **1092**

B. reviewed the literature on human embryonic and foetal death, abortion and abnormalities in offspring after maternal infections with various virus diseases. In the veterinary field he discussed transplacental infection of pig foetuses with lapinized swine fever virus; Japanese B. encephalitis and atrophic rhinitis; the role of the viruses of equine influenza, equine arteritis and infectious anaemia in abortion of mares; the association of Rift Valley fever virus and Wesselsbron virus with abortion; and the effect on the offspring, of infection of pregnant mice with ectromelia and psittacosis. There are 107 references.—E.G.

ANDREWES, C. H. & SNEATH, H. A. (1958). **The species concept among viruses.**—*Nature, Lond.* **182,** 12-14. **1093**

The authors questioned the value of attempting to apply the species concept to viruses, and considered that attempts to employ latinized 'specific' names should be abandoned. Instead, attention should be concentrated on the formation of groups of viruses. The position of coxsackie, "echo" and "arbor" virus was discussed and it was suggested that serotypes within these groups should be designated by numbers.—R.M.

KELLER, R. (1958). **Passage of bacteriophage particles through intact skin of mice.** — *Science* **128,** 718-719. **1094**

K. demonstrated that bacteriophage from *Bacillus megatherium* could pass through intact, undamaged skin of mice. Since the head of the bacteriophage particles was about 49mμ wide, it may be possible for animal viruses of similar size to pass through the skin.—R.M.

CVJETANOVIĆ, V. & BERBEROVIĆ, M. (1958). O heartwateru kod goveda i koza u Dalmaciji. (Osvrt na mediteransku ricketsiozu i heartwater ovaca). **[Heartwater in cattle and goats in Dalmatia. (Notes on Mediterranean rickettsiosis and heartwater in sheep).]**— *Veterinaria, Sarajevo* **7,** 215-220. [In Croat. Summary in English.] **1095**

Between July and December, 1957 three cattle, six sheep and one goat died in Dalmatia from a rickettsial infection, resembling heartwater. Diagnosis was based on P.M. lesions, rickettsia in endothelial cells in smears from vascular intima, spleen, kidney and brain, and by exclusion of bacterial and protozoal infections. The disease may also be present in other Southern European and Asian countries as was suggested by resistance to heartwater in Iranian sheep imported into South Africa. Characteristics of Mediterranean rickettsiosis and heartwater were discussed.—E.G.

See also abstr. **1162** (research on animal diseases in Australia); **1164** (zoonoses in the French Sudan); **1264-1265** (report, Mukteswar); **1267** (book, psittacosis).

IMMUNITY

ROBBINS, J. & STETSON, C. A., JR. (1959). **An effect of antigen-antibody interaction on blood coagulation.**—*J. exp. Med.* **109,** 1-8. [Authors' summary modified.] **1096**

Each of several antigen-antibody systems studied was found to affect the coagulation mechanism in the rabbit, causing a marked shortening of the coagulation time of samples of whole blood in silicone-coated test tubes. Addition of specific antigen to the blood of actively immunized rabbits or addition of antigen-antibody mixtures to the blood of normal rabbits produced the effect. The coagulation time of plasma was not affected, indicating that the phenomenon may be mediated by an effect on platelets. This effect of antigen-antibody interaction may be involved in the production of tissue damage *in vivo*.

HOLUB, M. (1958). **Antibody production by lymphocytes after *in vitro* contact with bacterial antigen and transfer to new-born rabbits.**—*Nature, Lond.* **181,** 122. **1097**

Lymph from adult rabbits was washed (except in 3 cases) with Hank's soln., suspended in 1–2 ml. of this soln., mixed with bacterial antigen and injected i/p into new-born rabbits. Litter mates, used as controls, received: isolated

spleen cells with antigen; lymph cells without antigen; cell-free lymph supernatant with antigen; antigen alone. Antibodies appeared in about 90% within 2–4 days, with a peak at 5–8 days, after transfer of lymph cells, and there was a direct correlation between the quantity of transferred cells and antibody titre. In splenectomized animals negative results are taken to suggest that antibody formation occurs in the spleen. Spleen cell transfer resulted in 100% antibody formation. From these results and those of histological examination it is concluded that lymphocytes can form antibodies after transfer to new-born animals, the metabolic change being associated with transformation of less mature cells into macrophages and plasma cells which, however, may not be responsible for all of the antibody formed.—T.E.G.R.

ASHTON, G. C. (1958). **A genetic mechanism for 'thread protein' polymorphism in cattle.** —*Nature, Lond.* **182,** 65-66. **1098**

"Thread protein" is the term applied to protein fractions which in patterns produced by starch-gel electrophoresis appear as paired thin wavy lines or threads [see also *V.B.* **28,** 2896]. Four phenotypes were demonstrated in Friesian cattle. Their significance is unknown.—R.M.

CHANG, T. S., RHEINS, M. S. & WINTER, A. R. (1958). **The significance of the bursa of Fabricius of chickens in antibody production. 2. Spleen relationship.**—*Poult. Sci.* **37,** 1091-1093. [Authors' summary modified.] [For part I, see *V.B.* **28,** 782.] **1099**

The spleen performs some function of the bursa of Fabricius, as indicated by an increase in size following injection of *Salmonella typhimurium* O antigen in young bursectomized chickens.

The bursa performs some function of the spleen, as indicated by an increase in size following injection of antigen in splenectomized chickens.

The bursa of Fabricius is important for the formation of *S. typhi-murium* O antibodies in young chickens while the spleen is not apparently necessary for this function.

PAULISSEN, L. J. & SHECHMEISTER, I. L. (1958). **The effect of sublethal whole-body X radiation on active immunity.] — *J. infect. Dis.* 103,** 188-195. [Authors' summary modified.] **1100**

The effects of whole-body X-irradiation on acquired immunity in mice were investigated using *Salmonella enteritidis*. The response of mice which were immunized, irradiated and then challenged was compared with that of mice treated in the same way except for immunization. Although X-irradiation (350 r) lowered the resistance of immunized as well as control mice the LD_{50} for the immunized group was significantly greater.

KOVALENKO, Y. R. (1958). **[Influence of inoculation of immune serum on the development of immunity from subsequent vaccination.]**—*Veterinariya, Moscow* **35,** No. 7 pp. 15-20. [In Russian.] **1101**

Inoculation of piglets with swine fever immune serum in prophylactic doses, 15 days before s/c or i/d inoculation of crystal violet swine fever vaccine, reduced the development of active immunity. After administration of immune serum some piglets maintained some passive immunity for up to 40 days.

Mice were inoculated with swine erysipelas immune serum 3, 6 and 15 days before inoculation of live erysipelas vaccine of the Voronezh type [*V.B.* **27,** 1658]. A large proportion died when challenged with virulent culture 15 days after the vaccine. Administration of immune serum 3–6 days after vaccination inhibited the development of active immunity in a large proportion of mice.—R.M.

BÜHNER, F. (1958). 33 Fälle von Pferdeserumschock beim Rind. **[Horse-serum shock in 33 cattle.] — *Berl. Münch. tierärztl. Wschr.* 71,** 141-144. [Summary in English.] **1102**

33 cases of shock in cattle are described, 24 of them acute, caused by the injection of horse serum; in 30 this was the first exposure to horse serum. A method of treatment is described: atropine sulphate (20–40 mg.) is injected s/c or i/m, or i/v if possible, and a mixture of equal quantities of Lugol's soln. and water (30–40 ml.) is injected s/c into the dewlap. Surgical intervention may also be necessary, to prevent suffocation from oedema of the larynx and to relieve tympanites. Of 9 cases of acute shock treated in this manner, 8 recovered and one died from acute tympanites; this animal would probably have been saved by rumen puncture. Of the remaining 15 cases of acute shock, which were untreated or given other forms of treatment, 9 recovered and 6 died.—M.G.G.

See also abstr. **927-928** (anthrax); **935** (TB.); **947** (swine erysipelas); **952-953** (pasteurellosis); **981-998** (brucellosis); **999** (leptospira antibodies in periodic ophthalmia); **1005** (leptospirosis agglutination test); **1007** (leptospira vaccines); **1008** (tetanus and botulism vaccines); **1041-1046** (F. & M. disease); **1047** (Aujeszky's disease); **1052** (vaccinia); **1053** (immunization of children with milk from immunized cows); **1054-1055** (sheep pox); **1061-1064** (rinderpest); **1076-1077** (distemper); **1082-1083** (Newcastle disease); **1085** (laryngotracheitis); **1115** (echinococcus antigen); **1135** (cancer); **1259** (agar double diffusion precipitin technique).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

HEWITT, R., EMRO, J., ENTWISTLE, J., PANKAVICH, J., THORSON, R., WALLACE, W. & WALETZKY, E. (1958). **Carbamoyl alkyl phosphorodithioates as chemotherapeutic agents: Effects of dimethoate against grubs in cattle.** — *J. econ. Ent.* **51,** 445-450. [Authors' summary modified.] **1103**

In 21 cattle, single oral doses of from 2·5 to 40 mg./kg. and intramuscular doses of 5 and 10 mg./kg. of dimethoate (*O,O*-dimethyl-*S*-(N-methylcarbamoylmethyl) phosphorodithioate) killed 86% to 100% of second instar *Hypoderma* larvae in the backs of cattle within a week. The lowest dose tested with *H. bovis* was 5 mg. per kg. 10 mg./kg. was the lowest dose uniformly highly effective against third instar larvae.

Single oral or intramuscular doses of 10 and 20 mg./kg. of dimethoate killed 50% or more of the first instar larvae of *H. lineatum* in the gullets of all of five calves within 14 to 25 days. A similar effect was obtained in one calf treated with 5 mg./kg. orally and slaughtered 25 days later, but not in two calves treated with 5 mg. per kg. intramuscularly.

In calves weighing 118 to 427 kg., single oral doses of 40 mg./kg. and above, of dimethoate produced severe toxic symptoms, and 80 or 100 mg./kg. were lethal in 2 days or less; 15 and 20 mg./kg. produced mild toxic symptoms, and doses lower than 15 mg./kg. caused no symptoms. Data on toxicity in sheep and other animals are presented. No differences were observed between the toxicity of 99% and 94% material, and two different drench formulations in ruminants gave comparable results.

Comparisons are given with other compounds that are active against cattle grubs.

ANON. (1958). **Systemic insecticide effective in controlling grubs in cattle, screwworms in sheep.**—*Fed. Vet.* **15,** 7-8. **1104**

This is a note on experiments carried out by O. H. Graham with Bayer 21/199 for hypoderma control in cattle [see *V.B.* **28,** 3997] and of screw-worms in sheep. Suspensions made from wettable powder containing 25% active ingredient were used as sprays in concentrations of 0·25% and 0·5%. In general, animals were protected for 2–3 weeks, sufficient time for shearing wounds to heal so that they no longer attracted "screw-worm" flies.—T.E.G.R.

FLYNN, A. D. & EDEN, W. G. (1958). **Systemic insecticidal action on bloodsucking ectoparasites of several compounds administered orally to rabbits.**—*J. econ. Ent.* **51,** 499-501. [Authors' summary modified.] **1105**

Of 28 synthetic organic compounds screened for systemic insecticidal activity by administering them orally to rabbits and allowing blood-sucking arthropods to feed on the rabbits, all were tested against the bed bug, *Cimex lectularius;* and against *Amblyomma maculatum, Aedes aegypti,* and *Stomoxys calcitrans.*

At the highest dose rates that failed to produce visible toxic symptoms in the rabbits, five of the compounds had systemic activity against the bed bug. These compounds and the dosage rates to the rabbits (mg./kg.) were: Bayer 18613 (1100); Bayer 19596 (625); Bayer 19994 (25); Bayer 13242 (25); and Bayer 17364 (7). None had systemic action against the tick or mosquito. There were indications that the compounds had systemic action against the stable fly, but the results were inconclusive.

LORBER, M. G. (1958). **DDVP—A new insecticide.**—*Vet. Med.* **53,** 492-493. **1106**

DDVP (*O, O,* dimethyl-2,2 dichlorovinyl phosphate), or "Herkol", is a new fumigant insecticide claimed to be very effective but less toxic to mammals than TEPP or parathion. The vapour had no apparent effect on 2 dogs and a cat in an atmosphere of 1·5 mg/cu. ft. for 18 hours. Sprayed into a confined space at the rate of 1·5 ml. of 50% solution per 1,000 cu. ft., DDVP is said to be completely effective against fleas, flies, ticks and lice in 4–6 hours, although engorged female ticks were not affected. Cotton wool soaked in DDVP solution and placed in a room kept down the numbers of flies inside over a period of 3 days, but did not prevent others entering.—W. N. BEESLEY.

DELIĆ, S., PETROVIĆ, Z. & RUKAVINA, J. (1958). Prilog poznavanju raširenosti krpelja u Bosni i Hercegovini. **[Ticks in Bosnia and Hercegovina.]** — *Veterinaria, Sarajevo* **7,** 297-316. [In Croat. Summary in English.] **1107**

Over 9,000 ixodid ticks belonging to 14 species were collected from cattle, horses, sheep and dogs in Bosnia and Hercegovina during 1956 and 1957. Details are given of geographical and seasonal incidence and predilection sites of various species.—E.G.

ONUFRIEV, V. P. (1957). **[Toxic action of 28 insecticides on *Ixodes ricinus*.]**—*Sborn. Trud. Leningrad. nauchno-issled. vet. Inst.* No. 7 pp. 128-135. [In Russian.] **1108**

None of the preparations tested had any repellent action or residual toxicity for the tick. Tests under lab. and field conditions revealed

that the following were of little value: 4% aqueous emulsion of "SK–9"; 7% aqueous suspension of BHC; 10% aqueous suspension of pentachlorin dust (containing 5% DDT); 2% aqueous soln. of the sodium salt of 2,4 D. The best preparation was a 5% liniment (with "solyar oil") of D.D.T. The preparations aldrin, dieldrin, heptachlor and sulphonate ester (4 chlorphenyl-4 chlorbenzol sulphonate) were lethal for ticks but it was stated that their action on the animal body had been insufficiently studied.—R.M.

KUZNETSOVA, G. M. (1957). **[Morphological changes in the skin of cattle parasitized by** *Hyalomma scupense.***]** — *Trud. Mosk. vet. Akad.* **19,** No. 1. pp. 304-317. [In Russian.] **1109**

K. examined histologically 500 biopsy samples of skin bitten by ticks. Tick bite was accompanied by acute inflammation with eosinophilia, probably caused by mechanical injury and a toxin in the saliva of the tick. The effect of tick bite on hide quality was dealt with by the same author on pp. 318–426 of this publication.—R.M.

WICHMANN, R. W. & VINCENT, D. J. (1958). **Cnemidocoptic mange in the budgerigar** (*Melopsittacus undulatus*). — *J. Amer. vet. med. Ass.* **133,** 522-524. [Authors' summary modified.] **1110**

Current information on cnemidocoptic mange in the budgerigar as caused by *Cnemidocoptes pilae* is presented.

Observations on the effect of several drugs in the treatment of the disease are described and their efficacy discussed. N-ethyl-*O*-crotonotoluide (10% in a vanishing cream base) was found to be effective in treating *C. pilae* infestations, and was non-toxic. A laboratory-prepared benzyl benzoate (25% emulsion) was effective; however, a commercial preparation of benzoate emulsion was toxic.

Recommendations for the treatment and control of the disease are discussed.

See also abstr. **924** (tabanids as transmitters of anthrax); **1056** (arthropod-borne viruses in Africa).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

COYLE, T. J. (1958). **Experiments in the diagnosis and treatment of fascioliasis in Uganda cattle.** — *Bull. epiz. Dis. Afr.* **6,** 255-272. [Summary in French pp. 288-294. Author's summary modified.] **1111**

Attention is drawn to the scarcity of literature on the pathology, treatment and control of infestation with *Fasciola gigantica,* a common parasite of cattle in Uganda. Abattoir records correlating the number of flukes with the degree of liver damage are given. There is evidence that resistance occurs. Results of work with *F. hepatica* infestation in European cattle are discussed in relation to *F. gigantica* infestation in African cattle. Diagnostic methods are discussed and an improved technique of determining *F. gigantica* ova in faeces by continuous washing and sedimentation is described. Figures are given for the correlation of faecal ova counts with the number of flukes in the liver. Attention is drawn to the necessity for large samples of faeces and repeated counts over a long period. The difficulties of treatment under African conditions are emphasized with the consequent advantages of a parenteral route of drug administration. Carbon tetrachloride s/c was disappointing, but trials are not yet complete. Hexachlorethane by mouth was promising. No toxicity was encountered with either drug. The habitats of the intermediate host are mentioned. It is considered that chemical attack on the snail would not be satisfactory. Infestation can be prevented by watering stock by means of troughs, ram pumps, tanks, etc.

DORSMAN, W. (1959). **Hexachlorophene (G-11) against liver flukes (Fasciola hepatica) in cattle.**—*Tijdschr. Diergeneesk.* **84,** 100-103. [In English. Summaries in Dutch, French and German. English summary modified.] **1112**

Hexachlorophene [bis (2–hydroxy–3, 5, 6–trichlorophenyl) methane] appears to be outstandingly active against *F. hepatica* in adult cattle at a dosage of 15 mg. per kg. body wt. Obvious signs of intoxication were not found with dose rates up to 20 mg./kg.

VON BÜLOW, V. (1957). Versuche zur Bekämpfung der Leberegelschnecke. **[Control of the liver fluke snail.]**—*Inaug. Diss. Hanover* pp. 68. **1113**

Attempts were made to control snails, principally *Limnaea truncatula,* by copper sulphate, pentachlorophenol or sodium pentachlorophenolate. Snails in ditches were killed by 4 g./cu.m. of the last named in one district and 10 g./cu.m. in another. For treatment of pastures 1–2 g./sq.m. was used in solution. An adequate volume of solution was important and

1,200–2,500 l./hectare was recommended. Fish were killed by conc. of 1 g./cu.m., but plants and grazing animals were not harmed.

Sodium pentochlorophenolate was regarded as the best of the 3 compounds tested.—R.M.

SINHA, P. K. & SRIVASTAVA, H. D. (1958). **Studies on the age resistance and resistance to superinfection of poultry against *Raillietina cesticillus* (Molin), with some observations on the host specificity of the parasite.**—*Indian vet. J.* **35,** 288-291. **1114**

Primary experimental infestation of chickens (two weeks old) did not protect them against re-infestation with the cestode administered one month later. Infestation could not be set up in chickens older than 10 weeks, nor in 5 other common species of birds [age not stated].

—R. N. MOHAN.

BOKO, F. (1958). Intradermalna ehinantigenska reakcija kod teladi. **[Intradermal reaction in calves to echinococcus antigen.]**—*Veterinaria, Sarajevo* **7,** 95-102. [In Croat. Summary in English.] **1115**

B. reported on a skin test for echinococcosis in 14 calves, using as antigen deproteinized hydatid cyst fluid, injected in doses of 0·2–0·3 ml. into the tail fold or scapular region. Ten calves which came from heavily infested dams yielded positive reactions, whereas those from healthy or very lightly infested ones were negative.—E.G.

DAVIS, D. E. & READ, C. P. (1958). **Effect of behavior on development of resistance in trichinosis.**—*Proc. Soc. exp. Biol., N.Y.* **99,** 269-272. [Authors' summary modified.] **1116**

"Wild" strain house mice were infected with embryonated larvae of *Trichinella spiralis*. 12 mice were isolated in jars and 12 were placed in 2 groups in a large can for 4 hours a day for 10 days. When killed on the 15th day the grouped mice had from 16–51 worms in the intestine while only 3 of the isolated mice had worms. To determine the effect on subsequent stages, 12 mice were infected. Six were isolated and 6 were grouped as above for 10 days. All were killed on the 30th day. The isolated mice averaged 1,054 larvae per g. muscle while the grouped mice averaged 1,556. It is concluded that behaviour may affect resistance and may be an important factor in epidemics and in development of host–parasite relations.

I. DEMIDOVA, N. V. (1957). **[Epidemiology of bunostomum infestation in sheep.]**—*Trud. Mosk. vet. Akad.* **19,** No. 1 pp. 327-338. [In Russian.] **1117**

II. DEMIDOVA, N. V. (1958). **[Bunostomum infestation of sheep.]**—*Veterinariya, Moscow* **35,** No. 7 pp. 50-55. [In Russian. Summary in English.] **1118**

I & II. *Bunostomum trigonocephalum* was studied experimentally and as it occurred in sheep in the Moscow area. It was concluded that infection occurred principally through the skin, because 85–89% of infective larvae developed after percutaneous introduction, while only 12 to 14% survived the oral administration. Larvae were recovered from the lungs from the 6th to 10th days after infection, and they could cause pneumonia. Larvae were recovered from the abomasum and intestines from the 12th–17th days after infection. Maturation of larvae in sheep faeces took 9–14 days in summer (temp. up to 28°C.) and 40–50 days in spring and autumn. Larvae did not survive the winter on pastures in the Moscow area; 10% survived 32 days at 20°C. and 20% survived 43 days at a temp. range of −18 to +15°. Nearly all lambs and adult sheep in the area studied were infected, and the average number of worms per animal was 112·4. Reduction in faecal egg counts occurred in July and August and again in December–February.—R.M.

OSIPOV, A. N. (1957). **[Survival of *Heterakis gallinarum* ova in winter.]**—*Trud. Mosk. vet. Akad.* **19,** No. 1. pp. 350-355. [In Russian.] **1119**

Faeces containing eggs of the nematode were placed in November in heaps measuring 15–20 cm. square and 5–7 cm. deep either on the soil surface or at a depth of 5–20 cm. When the faeces were examined at the beginning of April there were no infective ova, but by the end of April or the middle of May a high proportion of eggs contained larvae. Meteorological data are not given but it may be presumed that the experiments were done in the Moscow area.

—R.M.

TODD, A. C. (1958). **The swine parasite problem: the helminths.**—*Proc. 61st Ann. Meet. U.S. live Stk sanit. Ass., St. Louis,* 1957. pp. 284-286. **1120**

T. discussed the prevalence of helminth parasites. It was predicted that by the middle of 1958 over half the fattened pigs will have received anthelmintics, of which hygromycin B will be the commonest. T. quoted the work of Hanson & Karstad [*V.B.* **28,** 2124] as evidence of the possibility of transmission of vesicular stomatitis by ascarids, and suggested that other viruses may be carried by the worms, with the surprising conclusion that prevention of hel-

minth infestation may prevent virus infection. [In a later publication (abst. 1075) Hanson & Karstad state that they had been unable to isolate the virus of vesicular stomatitis from lower forms of life, including parasites, earthworms and animals which may be eaten by pigs.]—R.M.

YANG, P. & WEI, T. (1957). **[Studies on cattle thelazia from Kansu, China, including descriptions of three new species.]** — *Acta vet. zootech. sinica* **2,** 7-13. [In Chinese. Abst. from English summary.] **1121**

This paper deals with four species of thelazia from cattle, namely: *Thelazia rhodesi* (Desmarest, 1827); *Thelazia kansuensis* nov. sp.; *Thelazia brevispiculata* nov. sp. and *Thelazia hsüi* nov. sp.—R.M.

WHARTON, R. H., EDESON, J. F. B. & LAING, A. B. G. (1958). **Laboratory transmission of *Wuchereria malayi* by mosquito bites.** — *Trans. R. Soc. trop. Med. Hyg.* **52,** 288. **1122**

Attempts to transmit the nematode by feeding infected *Mansonia uniformis* on cats succeeded in 2 of 3 cats. In one cat microfilariae appeared in the blood from 76 days after infection, in the other they appeared after 106 days. —R.M.

VICTOR, D. A. (1958). **Cerebrospinal nematodiasis. II. Transplantation of *S. digitata* into experimental hosts.**—*Indian vet. J.* **35,** 224-226. **1123**

The author recorded failure to set up *Setaria digitata* infestation in two goats and a rabbit by transplanting into their peritoneal cavity live worms collected from cattle. —R. N. MOHAN.

RUKAVINA, J., DELIĆ, S. & JOVOV, K. (1958). Prilog poznavanju helminata sirišta i tankog crijeva goveda u Bosni i Hercegovini. **[Helminths in abomasum and small intestine of Yugoslav cattle.]** — *Veterinaria, Sarajevo* **7,** 61-66. [In Croat. Summary in English.] **1124**

Trichostrongylus axei, T. colubriformis, Ostertagia lyrata, O. ostertagi, Cooperia punctata, C. zurnabada, C. oncophora, Nematodirus helvetianus, Bunostomum phlebotomum, Strongyloides papillosus, Capillaria bovis and *Moniezia* species were present in abomasum and/or small intestine of 32 of 33 heifers examined. *Marshallagia marshalli* and *Ostertagia occidentalis,* normally parasites of sheep, were present in the abomasum of 10 and 6 heifers respectively.—E.G.

DELIĆ, S. & JOVOV, K. (1958). Prilog poznavanju raširenosti vrsta ovčjih trihostrongilida u Bosni i Hercegovini. **[Trichostrongylidae in sheep in Bosnia and Hercegovina.]** — *Veterinaria, Sarajevo* **7,** 263-268. [In Croat. Summary in English.] **1125**

Trichostrongylus axei, T. colubriformis, T. vitrinus, T. capricola, Cooperia curticei, Haemonchus contortus, Nematodirus filicollis, Ostertagia circumcincta, O. occidentalis and *Marshallagia marshalli* were present in abomasum and small intestine of 55 lambs and sheep in Bosnia and Hercegovina.—E.G.

See also absts. **1084** (tapeworms and intestinal lesions in Newcastle disease); **1164** (in the French Sudan); **1264-1265** (report, Mukteswar); **1268** (book, veterinary helminthology).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

DEKKER, N. D. M. (1959). Borstholte tumoren bij het paard. **[Thoracic tumours in horses.]** — *Tijdschr. Diergeneesk.* **84,** 44-52. [In Dutch. Summary in English.] **1126**

Three cases were described: (1) leucosis, possibly lymphosarcoma, of the lungs, bronchial lymph nodes, thymus and liver in a draught gelding aged six years; (2) a sarcoma, apparently originating from the thymus and with metastases in the renal lymph nodes in a hunter mare aged 5 years; (3) a sarcoma, again originating from the thymus and with metastases in the presternal, bronchial and mediastinal lymph nodes in a trotter mare aged 6 years.—R.M.

SUDARIĆ, F. (1958). Carcinoma bronchiale et alveolare mucinosum pneumoniaeformis konja sa neuspjelim ekstrapulmonalnim metastazama. **[Bronchial and alveolar carcinoma in a horse.]**—*Veterinaria, Sarajevo* **7,** 281-288. [In Croat. Summary in English.] **1127**

A detailed account of the clinical and P.M. findings in an army horse with pulmonary carcinoma. The stroma had only recently proliferated and the condition resembled chronic pneumonia. Organs were free from metastases. —E.G.

DURAN-REYNALS, F., JUNGHERR, E., CUBA-CAPARÓ, A., RAFFERTY, K. A., JR. & HELM-

BOLDT, C. (1958). **The pulmonary adenomatosis complex in sheep.**—*Ann. N.Y. Acad. Sci.* **70,** 726-742. **1128**

Sheep pulmonary adenomatosis (SPA) was first recognized in England in 1888 as a rare, slowly fatal adenomatous condition of the lungs causing emaciation, rapid shallow breathing and general weakness. In 1904, an infiltrative pneumonia was observed in South Africa. The two forms appeared in 1936 in Iceland as separate but related diseases in overlapping areas and became known as the highly contagious "Maedi" and epizootic pulmonary adenomatosis. In South Africa both forms are now occurring side by side, being known as Graaff-Reinet disease (a form similar to "Maedi") and jaagsiekte (a form identical with Icelandic P.A.), whilst in North America ("lunger disease") and France ("bouhite") a progressive pneumonia presenting both the infiltrative and adenomatous aspects of the SPA complex is occurring. In 1945 a metastasizing adenocarcinoma of the lung closely resembling jaagsiekte was reported from Peru. Both the infiltrative and adenomatous forms had been successfully transmitted experimentally in mixed and in relatively unmixed form, but serological relationship between the geographically separated forms has not yet been demonstrated.

—A. ACKROYD.

KONOPEL'KO, P. Y. (1957). **[Sarcomatous enteritis in a cow.]** — *Uchen. Zap. Vitebsk. vet. Inst.* **15,** 60-62. [In Russian.] **1129**

A 10-year-old cow died after a month of illness characterized by diarrhoea and inappetence. There was swelling of the wall of the rumen and thickening of the small intestine with constriction of its lumen. Histological examination of the intestinal lesions revealed a round-cell sarcoma.—R.M.

SCHILLER, A. G., MAKSIC, D., BEAMER, P. D. & ALBRECHT, A. D. (1958). **Fibrosarcoma of the urinary bladder in the dog.** — *J. Amer. vet. med. Ass.* **133,** 594-598. [Authors' summary.] **1130**

A dog with extensive neoplastic involvement of the bladder and a portion of the urethra was treated by cystectomy and partial urethrectomy, followed by ureterorectal anastomosis.

Approximately nine months later, the neoplasm, a fibrosarcoma, recurred with metastasis to the liver and the regional lymph nodes.

TRAUTWEIN, G. (1958). Über ein Sympathoblastom des Haushuhnes. **[Sympathoblastoma (sympathetic ganglioneuroblastoma) of the intestine in a hen.]**—*Dtsch. tierärztl. Wschr.* **65,** 353-356. [Summary in English.] **1131**

A tumour composed of sympathetic ganglion cells of varying degree of immaturity was found in the small intestine of an 18-month-old hen 3–8 cm. above the origin of the caeca. The tumour was multifocal, and lay in and between the muscle coats and in the subserosa. A possible primary origin from the myenteric plexuses is suggested.—E. COTCHIN.

BURGISSER, H. (1958). Tumeurs chez le gibier en Suisse (1945–1957). **[Tumours of wild mammals in Switzerland.]**—*Rev. Path. gén.* **58,** 481-496. [Summary in German.] **1132**

During 1945–57 tumours were detected P.M. in 20 of 1,847 animals examined, as follows. Roe deer: 1 adamantinoma, 1 soft fibroma, 3 sarcomas of the head (2 myoblastic, 1 osteoblastic), 1 basocellular epithelioma of the head, 1 osteoma of the head, 1 osteoblastic sarcoma of the femur (with metastases in the liver), 1 epithelioma of the prescapular lymph nodes (with metastases), 1 epitheliomatous metastases [site not specified]. Chamois: 1 cavernoma of the liver, 1 myoblastic sarcoma of the abdominal wall, 1 epithelioma of the adrenals and eyes (metastases). Hares: 1 bilateral uterine fibromyoma, 1 sarcoma (in liver and spleen), 1 leiomyoma of the uterus, 1 atypical sarcoma (in lymph nodes, liver, kidneys, ovary). Ibex: 1 adenoma of the thyroid and 1 fibroma of the small intestine. During recent years myeloid leucosis was diagnosed in 6 hares from different parts of the country. Lesions were found in the liver, spleen, kidneys, lungs, bone marrow, lymph nodes and myocardium.—T.E.G.R.

BARNES, L. L., SPERLING, G., MCCAY, C. M. & BROWN, C. E. (1958). **The production of osteogenic sarcomas in rats with radioactive calcium.**—*Arch. Path.* **66,** 529-535. [Authors' summary modified.] **1133**

Ca^{45} is a potent agent for the production of osteogenic sarcomas in rats when given in repeated doses during the period of rapid growth.

The average interval from the last dose of Ca^{45} until the appearance of a tumour or paralysis of the hind legs was 155-207 days. The average time from the appearance of tumour or paralysis until death was 21-26 days.

Ten of the 29 tumour-bearing rats had multiple primary osteogenic sarcomas. Metastasis occurred in all of these. Nine of the remaining 19 rats with single osteogenic sarcomas had metastases.

The considerable amount of neoplastic carti-

lage in some of these tumours suggests that Ca^{45} is deposited in calcifying cartilage as well as in bone.

Total doses of less than 1 μc./g. body wt. are not likely to produce osteogenic sarcoma.

Ca^{45} produced no effect on the blood cell counts of the rats during the ensuing six months.

BIELSCHOWSKY, F. & HORNING, E. S. (1958). **Aspects of endocrine carcinogenesis.** — *Brit. med. Bull.* **14,** 106-115. **1134**

The various sections of this review deal with: (i) Mechanisms of hormone action in neoplasm formation, including direct, indirect and permissive actions; (ii) Definition of an endocrine tumour, including the concept of hormone-dependent and hormone-independent tumours; (iii) Tumours of the pituitary (secretory somato-mammo-, thyro- and gonadotrophic types); (iv) Tumours of the ovary induced by gonadal–pituitary imbalance in relation to parabiosis, intrasplenic grafting or local irradiation, or by chemical carcinogens; (v) Leydig-cell tumours of the testis produced by oestrogen; (vi) Tumours of kidney, epididymis, bone, and leucaemia and lymphomata, including the oestrogen-produced, oestrogen-dependent kidney tumour of hamsters, and epididymal tumours in hamsters induced by and dependent on a combination of oestrogen and androgen; (vii) Tumours of the adrenal, including cortical tumours arising in mice and rats after gonadectomy, or in stilboestrol-treated hamsters; (viii) Tumours of the prostate—including the suggestion that excessive amounts of oestrogen may be the cause of cancer of the prostate in man and in dogs; (ix) Tumours of the uterus; (x) Cancer of the breast with particular reference to pituitary factors; (xi) Endocrine therapy, referring to the use of ovariectomy, adrenalectomy and hypophysectomy in treatment of breast cancer in women.—E. COTCHIN.

GREEN, H. N. & WILSON, R. (1958). **Further observations on tumour-enhancing factors: their bearing on the immunological theory of cancer.**—*Nature, Lond.* **182,** 1054-1058. **1135**

A condensed account of observations on the enhancement of the growth of transplanted homologous tumours by pre-treatment of the recipient animal with tumour saline-soluble protein or lipoprotein fraction, or crude phospholipid derived from frozen tumour, or (to a lesser extent) by saline-soluble phospholipid from normal tissue or from another tumour type. Enhancement appeared to be a form of induced rapid adaptation, most probably by selection of cells, to the immune resistance due to strain-differences in the host (tumours in inbred strains did not respond to enhancing factor treatment in this strain). Enhancement, which was strikingly strain specific, appeared to be an immunological process; it seemed likely that pre-treatment with enhancing factor provided a primary sensitizing antigen, and a rapid outflow of lipoprotein antibody, concerned in the selection of more rapidly-growing cells, occurred on stimulation by the secondary challenge with tumour cells. The facts of enhancement might be explained by, and incorporated into, the immunological theory of cancer.—E. COTCHIN.

BOYLAND, E. (1958). **The biochemistry of cancer of the bladder.**—*Brit. med. Bull.* **14,** 153-158. **1136**

The available evidence indicates that 2-naphthylamine is oxidized in part to 2-amino-1-naphthol in the liver, and conjugated immediately with sulphuric or with glucuronic acid, and then excreted in the urine. In acid urine it is acted upon by the excreted β-glucuronidase to form the carcinogenic 2-amino-1-naphthol. Differences in species susceptibility to experimental bladder cancer would be due to differences in the nature of the excreted metabolites.

Spontaneous bladder cancer, not arising in workers in the dyestuffs industry or otherwise exposed to carcinogenic amines, might be due to the presence of o-aminophenols, metabolic products of tryptophan, occurring in human urine. These metabolites are excreted as conjugates with sulphuric or with glucuronic acid. They would be hydrolysed by the appropriate enzyme, present in almost all urines, but in higher concentrations in patients with bladder cancer. The activity of the urinary enzymes can be reduced by oral administration of sodium phosphate, an inhibitor of sulphatase, or of glucosaccharo-1 ⇄ 4-lactone, a competitive inhibitor of β-glucuronidase. Treatment with such a drug might be useful post-operatively in bladder cancer cases, or particularly in preventing bladder cancer following accidental exposure to known carcinogenic amines.—E. COTCHIN.

DALTON, P. J. (1959). **The erythrocyte sedimentation rate as a guide to the radio-sensitivity of neoplasms.**—*Vet. Rec.* **71,** 49-51 & 52. [Author's summary.] **1137**

A method is described by which it is possible to determine the radio-sensitivity of a lesion by a comparison of the erythrocyte sedimentation rate of blood samples taken before and after X-irradiation.

BERNHARD, W. & GUÉRIN, M. (1958). Présence de particules d'aspect virusal dans les tissus

tumoraux de souris atteintes de leucémie spontanée. **[Presence of virus-like particles in tumour tissue from mice with spontaneous leucaemia.]** — *C. R. Acad. Sci., Paris* **247,** 1802-1805. **1138**

Tissues infiltrated with leucaemia cells (spleen, lymph nodes, thymus) and neoplasms of parotid gland were obtained from 16 mice with spontaneous lymphomatosis and were prepared for electron microscopy. Three different types of particle, between 30 and 150 mμ in diam. were seen in material from 9 of 16 cases. Their significance was discussed.—R.M.

Burmester, B. R., Fontes, A. K., Walter, W. G. & Gross, M. A. (1958). **Studies on the neutralization of virus causing visceral lymphomatosis and related neoplasms.** — *Poult. Sci.* **37,** 1190. [Authors' abst. modified.] **1139**

Standard cell-free preparations of Strain RPL 12 regularly cause visceral lymphomatosis, erythroblastosis and osteopetrosis. The incidence of these diseases was greatly reduced or prevented by the *in vitro* addition of serum from several sources. High neutralizing activity was found in the serum of (1) fowls that had been repeatedly injected with live or killed Strain RPL 12; (2) progeny of such fowls; and (3) some fowls of normal appearance from a naturally infected flock. Moderately high levels of neutralization were obtained with the serum of fowls of one of the following groups: (1) survivors of Rous sarcoma; (2) fowls repeatedly injected with formolized material from a strain of erythroblastosis; (3) fowls injected with formolized material from a strain of myeloblastosis (granuloblastosis). The data indicated that if visceral lymphomatosis, erythroblastosis granuloblastosis and Rous sarcoma are each caused by specific viral agents, there is a rather close immunological relationship among them.

See also abstr. **1086-1087 (avian erythroblastosis).**

NUTRITIONAL AND METABOLIC DISORDERS

Flatt, W. P., Warner, R. G. & Loosli, J. K. (1958). **Influence of purified materials on the development of the ruminant stomach.** — *J. Dairy Sci.* **41,** 1593-1608. [Authors' summary modified.] **1140**

Young dairy calves equipped with rumen cannulas were fed on milk and housed on raised wooden platforms. Various materials such as plastic sponges, cellulose sponges, a purified diet, solutions of the sodium salts of acetic, propionic, butyric, and lactic acids were introduced through the cannulas for periods up to 12 weeks. The presence of plastic sponges alone did not elicit development of the rumen papillae. The rumens of calves receiving either the purified diet or the fatty acid solutions, with or without sponges, showed marked development.

These data confirmed the view that end-products of rumen fermentation rather than the coarse nature of the feed are the stimuli for the development of rumen papillae.

Colvin, H. W., Jr., Cupps, P. T. & Cole, H. H. (1958). **Efficacy of oat hay as a legume bloat preventive in cattle.**—*J. Dairy Sci.* **41,** 1557-1564. [Authors' summary modified.] **1141**

Good oat hay was fed overnight to 17 dry cows, to study its effectiveness in controlling bloat resulting from grazing succulent, immature lucerne pasture. The pre-test, test, and post-test periods were each divided into four morning and two afternoon grazing subperiods. It was found that the overnight feeding of an average of 12 lb. of oat hay per cow significantly reduced the incidence and severity of acute legume bloat.

The mechanism by which grass hays protect against bloat is unknown; however, three possibilities have been suggested: (1) They physically prevent the formation of froth, (2) they contain a chemical antifrothing agent, or (3) their scabrous nature causes a stimulation of receptors in the rumen responsible for maintaining the tonic activity of rumen motility and eructation by reflex action. Possibly all three factors act simultaneously.

Weller, R. A., Gray, F. V. & Pilgrim, A. F. (1958). **The conversion of plant nitrogen to microbial nitrogen in the rumen of the sheep.** —*Brit. J. Nutr.* **12,** 421-429. [Authors' summary modified.] **1142**

That diaminopimelic acid is present in rumen bacteria and absent from plants and rumen protozoa, was used as a basis for determining bacterial nitrogen in mixtures of plant and microbial nitrogen in rumen contents in sheep. The distribution of nitrogen in rumen contents was determined by first separating the material crudely into plant and microbial fractions by filtration and washing. Correction for the bacteria remaining in the plant-fibre fraction was made on the basis of its diaminopimelic acid content. Correction for the plant material contaminating the microbial fraction was made on the basis of the amount of lignin present. Soluble

nitrogen was determined separately. In rumen material from sheep fed on wheat hay and slaughtered at intervals from 2 to 24 hours after feeding, 63–82% of the total nitrogen was microbial nitrogen, 11–27% plant nitrogen, and 5–10% soluble nitrogen. The diaminopimelic acid present in the microbial fraction was also used to differentiate the bacterial from the protozoal nitrogen.

FORBES, M., SUPPLEE, W. C. & COMBS, G. F. (1958). **Response of germ-free and conventionally reared turkey poults to dietary supplementation with penicillin and oleandomycin.**—*Proc. Soc. exp. Biol., N.Y.* **99,** 110-113. [Authors' summary modified.] **1143**

Turkey poults of two breeds reared "germ-free" grew well on a purified type washed Drackett protein starch basal diet. Supplementing the diet with procaine penicillin (45 mg./kg.) or with oleandomycin (30 mg./kg.) did not improve growth. In concurrent tests, conventionally reared poults fed the basal ration grew at a lower rate than the germ-free poults while those fed the basal ration supplemented by either penicillin or oleandomycin grew at a rate comparable to that of the germ-free poults.

O'MOORE, L. B. & SMYTH, P. J. (1958). **The control of cobalt deficiency in sheep by means of a heavy pellet.** — *Vet. Rec.* **70,** 773-774. **1144**

Thirty ewe hoggets were placed on a calcareous sandy pasture in which the cobalt content of the herbage was less than 0·04 p.p.m. Ten hoggets each received a heavy pellet containing 90% cobaltic oxide, 10 received 70 mg. of cobalt in aq. soln. every fortnight, and 10 were untreated. Over a period of 9 months the group with pellets made bigger weight gains than the group drenched fortnightly, while pine developed in the untreated group.—M.G.G.

BARLOW, R. M. (1958). **Recent advances in swayback.**—*Proc. R. Soc. Med.* **51,** 748-752. [Author's conclusions.] **1145**

Whilst the clinical picture of swayback is fairly characteristic, variations in the pathological manifestations have been observed.

Though diagnostic when present, the inconstancy of the cerebral lesion, and its absence in some of the more severe cases, suggests that the fundamental lesion may be elsewhere.

The interpretation of Marchi preparations of the spinal cord taken by routine methods should be treated with reserve.

The presence of necrotic neurons is a useful aid to diagnosis. The suggestion of more widespead cellular changes indicates the need for further work.

Similarities between normal fœtal and swayback brains have been observed which would support the theory of myelin aplasia or dysplasia, if substantiated.

SANE, C. R., DESHPANDE, S. P., DESHPANDE, B. R. & KAIKINI, A. S. (1958). **Herd infertility in Gir cattle due to copper deficiency.** —*Indian vet. J.* **35,** 154-161. **1146**

In a group of heifers, low blood copper levels were associated with clinical signs suggestive of copper deficiency, anoestrus, and granular vaginitis. Under treatment with copper sulphate and cobalt sulphate, administered daily, blood copper levels returned to normal and most of the animals conceived in 2 to 9 months.

—R. N. MOHAN.

DEMPSEY, H., CARTWRIGHT, G. E. & WINTROBE, M. M. (1958). **Copper metabolism. XXVIII. Influence of biliary duct ligation on serum and tissue copper.** — *Proc. Soc. exp. Biol., N.Y.* **99,** 67-69. [Authors' summary modified.] **1147**

Ligation of the bile duct of adult male rats was followed by hypercupraemia and deposition of copper in liver and kidneys, but not in the brain.

TERPSTRA, J. I. & AKKERMANS, J. P. W. M. (1958). Anemie bij biggen. **[Piglet anaemia.]** — *Tijdschr. Diergeneesk.* **83,** 639-650. [In Dutch. Summaries in English, French and German.] **1148**

The authors described haematological studies on 10 litters kept permanently indoors. Half the piglets in a litter with low haematocrit values were injected at 7 days of age with an iron preparation ("Imferon"). After a week there was a considerable increase in the haematocrit, haemoglobin and erythrocyte values compared with untreated piglets of the same litter, and at 6 weeks of age the treated piglets weighed about 3 kg. more than the untreated. Similar results were obtained with other litters treated at 4 days or 2 or 3 weeks. The aetiology of piglet anaemia was discussed.—R.M.

EDWARDS, H. M., JR., YOUNG, R. J. & GILLIS, M. B. (1958). **Studies on zinc in poultry nutrition. 1. The effect of feed, water and environment on zinc deficiency in chicks.**— *Poult. Sci.* **37,** 1094-1099. [Authors' summary modified.] **1149**

In experiments with chicks reared under various conditions, it was found that severe symptoms of zinc deficiency could be produced

in chicks housed in plastic and stainless steel cages and given glass-distilled water.

A variable and a less severe zinc deficiency was obtained with chicks housed in the standard galvanized brooder even though the chicks were given glass-distilled water and special precautions were taken regarding the method of feeding and watering. However, a more severe zinc deficiency was obtained when the brooder was coated with an epoxy resin and the chicks were fed and watered from stainless steel troughs.

NETHERLANDS. (1957). Instituut voor biologisch en scheikundig onderzoek van landbouwgewassen Wageningen. Mededeling 35. Jaarverslag 1957. **[Institute for biological and chemical examination of agricultural plants. Annual Report for 1957.]** pp. 33. Wageningen: The Institute. [In Dutch.] **1150**

Among the other activities, the relation of chemical composition of pasture to the incidence of grass tetany in cows was investigated (A. Kemp). Low Mg content of grass was associated with high nitrogen and high postassium content and *vice versa*. Trace elements in foodstuffs were studied, with reference to copper deficiency in cattle in Friesland (W.B. Deijs & J. Hartmans). —R.M.

FORMAN, S. A., SAUER, F., LAUGHLAND, D. H. & DAVIDSON, W. M. (1958). **Volume and acidity of urine of sheep fed hay rich in silica and effect of dietary salt additions.**—*Nature, Lond.* **182,** 1385. **1151**

The pH of the urine was 5·5 in 3 test sheep fed hay containing 8·28% silica, and 8·2 in 3 control sheep fed hay containing 0·78% silica. Controls drank twice as much water and excreted twice as much urine as test sheep. Addition of a mixture containing sodium hydrogen phosphate and salts of magnesium, calcium and potassium to the diet of the test sheep increased the volume of urine to that of the controls, and raised its pH to about 8. It is considered that the feeding of salts may control silica urolithiasis. —M.G.G.

UDALL, R. H. & JENSEN, R. (1958). **Studies on urolithiasis. II. The occurrence in feedlot lambs following implantations of diethylstilbestrol.** — *J. Amer. vet. med. Ass.* **133,** 514-516. [Authors' summary modified.] **1152**

Sixty of 300 "feedlot" wether lambs died from urolithiasis within 35 days after they were implanted with 30 mg. of stilboestrol. None of 150 untreated control lambs was affected.

SEMENOVA, L. P. (1958). **[Changes in nerve endings in muscle in vitamin E-deficient rats.]** —*C. R. Acad. Sci. U.R.S.S.* **120,** 1162-1164. [In Russian.] **1153**

Lesions in the nerve endings occurred after the establishment of muscular lesions.—R.M.

MUTH, O. H., OLDFIELD, J. E., REMMERT, L. F. & SCHUBERT, J. R. (1958). **Effects of selenium and vitamin E on white muscle disease.**—*Science* **128,** 1090. **1154**

Reports on the pharmacodynamic interrelationship of selenium and vitamin E in liver necrosis of rats and "exudative diathesis" of chicks prompted the inclusion of this element in an experiment on white muscle disease of lambs associated with the feeding of legumes to ewes during pregnancy. The results appear to indicate that selenium (0·1 p.p.m. in hay) had a definite protective effect; further investigation of the role of selenium in white muscle disease and other myopathies was warranted.—R.M.

CAPUTTO, R., MCCAY, P. B. & CARPENTER, M. P. (1958). **Requirements of Mn^{++} and Co^{++} for the synthesis of ascorbic acid by liver extracts of animals deprived of tocopherol.**—*J. biol. Chem.* **233,** 1025-1029. **1155**

Ascorbic acid synthesis in the liver of rats was impaired by vitamin E deficiency. This was tested by adding an enzyme-containing extract of rat liver to a substrate consisting of adenosine triphosphate, diphosphopyridine nucleotide, glucuronic acid and buffer. Addition of $MnSO_4$, $MnCl_2$ or $CoCl_2$ to this mixture trebled ascorbic acid synthesis by liver extract from deficient animals, but did not influence synthesis by extracts from normal animals. There were no differences in the amounts of Mn, Ca or Mg in the liver of deficient and normal rats, but total iron and ferric ions were slightly diminished in deficient rats. The findings suggested that in tocopherol deficiency the states of some metal ions were altered, causing them to function less efficiently.—R.M.

HORNOVÁ, O., WERFEL, F., HERBRYCH, K. & GAZDA, J. (1958). Křivonohost kachen způsobená nedostatkem niacinu. **[Bowed legs in ducks due to niacin deficiency.]**—*Sborn. čes. Akad. zemědělsk. Věd, Živoč. Výr.* **3(31),** 213-220. [In Czech. Summaries in English and Russian.] **1156**

Ten ducklings on a diet containing 53 mg. of niacin/kg. ration developed bowed legs after about three weeks. Ten duckings of another group, given 75 mg. niacin/kg. feed remained

normal and their weight averaged about 335 g. more than that of those in the first group. In practice, it was stated, the condition could be prevented by the addition of 7·5% of brewer's yeast to the ration.—E.G.

MIRSKY, I. A. & GITELSON, S. (1958). **The diabetic response of geese to pancreatectomy.** —*Endocrinology* **63,** 345-348. **1157**

Unlike the chicken or duck, the goose develops a diabetic syndrome in the absence of the pancreas.—R.M.

BUCHANAN, W. W., ANDERSON, J. R., GOUDIE, R. B. & GRAY, K. G. (1958). **A skin test in thyroid disease.**—*Lancet* November 1st, 928-931. [Authors' summary modified.] **1158**

Intradermal tests, using a saline extract of human thyroid tissue as antigen, were carried out in 52 subjects, of whom 33 had thyroid disease. There was close correlation between the presence of circulating thyroid precipitins and strongly positive skin reactions.

In general, positive skin reactions were observed in patients with Hashimoto's disease or with primary myxoedema. With one exception, positive reactions did not occur in individuals without clinical evidence of thyroid disease. The skin reaction was compatible with an Arthus phenomenon, and the addition of cortisone acetate to the inoculum tended to increase the size of the reaction. These findings show that thyroid antigen is capable of producing an abnormal tissue reaction in thyroid diseases suspected of having an auto-immune aetiology.

WEIGHTON, C. (1958). **Metabolic diseases of the ruminant. Vitamin D in milk fever in cattle.** — *Vet. Rec.* **70,** No. 49. Part 2. pp. 1006-1011. Discussion: pp. 1022-1028. [Author's summary modified.] **1159**

The major part of the paper is devoted to aetiology, the prophylactic effect of vitamin D feeding, and views on the action of vitamin D in maintaining a blood calcium level high enough to ward off an attack of milk fever.

The feeding of 15 million units of vitamin D night and morning for 3 to 7 days pre-partum, to cows which have previously been affected with milk fever has been shown to be an effective method of preventing the disease.

GLÄTTLI, H. (1958). Ist die Gebärparese der Kuh eine allergische Krankheit? **[Is parturient paresis in cows an allergy?]** — *Tierärztl. Umsch.* **13,** 7-14. **1160**

Having experienced failures in the treatment of milk fever in cows with calcium chloride soln. and vitamin D, the author suggests that it is an allergic condition caused by proteins in the milk. For over 2 years he has obtained good results by giving i/v 20-40 ml. of a proprietary calcium preparation in combination with 40-50 ml. of antazoline, an antihistamine.—M.G.G.

HOLMES, J. R. (1958). **Metabolic diseases of the ruminant. Ketosis in the ruminant.**—*Vet. Rec.* **70,** No. 49. Part 2. pp. 1012-1022. Discussion: pp. 1022-1028. [Author's summary modified.] **1161**

The paper commences by defining the term "ketosis" and enumerating the diseases in which ketosis is a characteristic feature. The origin of the ketone bodies is discussed. The important influence of the metabolism of the individual animal is stressed and the factors which may induce a ketonaemia are considered to fall into two main groups, nutritional and endocrine.

The influence of nutrition is considered first by reference to the circumstances under which pregnancy toxaemia in the ewe and acetonaemia in the cow occur. The increasing nutritional requirement in later pregnancy in the ewe and early lactation in the cow is emphasized. The effects of experimental fasting in advanced pregnancy in the ewe and cow and in the immediate post-parturient period in the cow are considered and compared with the natural diseases in the two species.

The influence of disturbance in endocrine equilibrium as an aetiological factor in ruminant ketosis is considered, reference being made to the haematology, histopathology and biochemistry of clinical cases.

The symptoms are briefly described and an attempt is made to correlate symptoms with lesions, particularly in the ewe.

Diagnostic methods are briefly discussed, including conditions to be considered in differential diagnosis.

Preventive measures are considered in some detail, particularly in relation to nutritional requirements in both the ewe and the cow. Suggestions are included for further work on the nutritional and hormonal aspects of the disease.

Current methods of treatment are summarized.

DISEASES, GENERAL

BULL, L. B. (1958). **Some advances in research on problems of the animal industry in Australia during the last twenty-five years.**—*Emp. J. exp. Agric.* **26,** 92-103. **1162**

Progress in disease control and animal husbandry during the last 25 years is briefly reviewed. Tuberculosis was controlled by a wider use of diagnostic methods and slaughter of affected animals; satisfactory results are reported for the short thermal tuberculin test as a supplementary test in problem herds. An approved *Br. abortus* Strain 19 vaccine is in use for the control of contagious abortion. Vibriosis and trichomoniasis are under investigation. Eradication of bovine contagious pleuropneumonia from certain areas was rendered possible by the evolution of a reliable c.f. test and a living culture vaccine; successful experimental reproduction of the disease facilitated further research. Leptospirosis of calves is now under control. Babesiasis is a major problem in the higher rainfall tropical and subtropical regions; dipping in D.D.T. is used for tick control. Contagious foot rot of sheep was eradicated from individual properties by the use of copper sulphate and formalin solns., and also chloramphenicol. Epididymitis of rams was controlled by culling infected ones and isolating the young. Salmonella infections of sheep were relatively common. Outbreaks with severe mortality, associated with dietetic errors before or during transport, were controlled by attention to diet. For contagious ecthyma of sheep a live vaccine is used to initiate resistance in lambs each year. Ephemeral fever of cattle is now enzootic and causes little trouble. Swine fever and Newcastle disease have been eradicated. Prophylactic vaccination is used for the control of fowl pox and infectious laryngotracheitis. Progress is reported in the control of helminth infestations of sheep and cattle. Prevention of cutaneous myiasis of sheep was attempted from two angles: selective breeding against wrinkly and excessive skin of the breech, and surgical removal of excessive skin; both methods, usually conjointly, gave good results. Infectious necrotic hepatitis of sheep was brought under control over 25 years ago. Infectious enterotoxaemia of sheep and botulism were controlled by prophylactic vaccination. The incidence of caseous lymphadenitis and erysipelas was reduced by better hygiene and husbandry. Mycotic dermatitis of sheep, and occasionally of horses and cattle, has become more troublesome recently. Increased incidence in some regions is ascribed to the newer insecticides not containing bacteriostatic or fungistatic substances. Diseases dealt with under the heading "non-infectious and environmental diseases" include: prussic acid poisoning from plants, *Heliotropium europaeum* poisoning, Kimberley ("walkabout") horse disease, Birdsville disease, phalaris staggers and phytogenous chronic copper poisoning. The concluding section deals with applied physiology in relation to animal production. A list of references is appended.

—T.E.G.R.

UILENBERG, G. (1959). Diergeneeskunde in de Soedan. **[Veterinary practice in the Sudan.]** — *Tijdschr. Diergeneesk.* **84,** 55-63. [Summaries in English, French and German. English summary modified.] **1163**

A general survey is given of the infectious and parasitic diseases and their treatment in animals in the Republic of the Sudan.

SANKALE, M., LE VIGUELLOUX, J., RIVOALEN, A. & MILHADE, J. (1958). Les zoonoses au Soudan français. Étude d'ensemble. **[Zoonoses in the French Sudan.]** — *Bull. Méd. A.O.F., Dakar* **3,** 30-39. **1164**

There were 3·5 million human beings in the French Sudan, compared with 3 million cattle, 615 million sheep and goats, 79,000 horses, 230,000 donkeys and 93,000 camels. Each year 2 or 4 human beings died from rabies contracted most often from dogs but also from cats and monkeys. Psittacosis and cat-scratch fever occurred. Rickettsial infections were common. Anthrax occurred in ruminants in two areas, but had been controlled in one area by vaccination. The ring test for brucellosis was positive in 16·2% of milk samples. *Fasciola gigantica* was endemic in sheep and goats but has not been recorded in man. Echinococcus was common. Porcine cysticercosis was rare but bovine cysticercosis was present in generalized form in 102 cattle and in localized form in 914 of 17,700 slaughtered cattle. Leptospirosis appeared to be absent or very rare.—R.M.

KUMM, H. (1958). Zusammenfassung der Tierschadenstatistik für die Deutsche Demokratische Republik 1954-1956. **[Statistics of livestock losses in the German Democratic Republic, for 1954-56.]** — *Mh. VetMed.* **13,** 529-530. **1165**

This is an account of losses in insured animals, which represent a half of the horse population, a third of the cattle, and a quarter of the pigs and sheep. In cattle 36·4% of the losses in 1956 were from disorders of the reproductive and urinary organs, 20·3% from infectious

diseases including brucellosis, 11·5% from diseases of the digestive organs, and 7·8% from parasitic infestations. In pigs 26·4% of the losses were from infectious diseases, 23·1% from diseases of the respiratory tract, 18·5% from diseases of the circulatory system including fatal syncope, and 15·6% from accidents. In sheep 49·8% of the losses were from helminth infestations. Diseases of the digestive organs accounted for 27·5% of the losses in goats and 25% in horses.—M.G.G.

KNOX, B. (1958). En oversigt over sygdomme hos mink. **[Diseases of mink in Denmark.]** —*Medlemsbl. danske Dyrlaegeforen.* **41,** 1-19. [In Danish.] **1166**

A general account. Denmark is now the fourth largest mink producer. The mink population is now over 750,000. Of some 2,000 farms the largest have about 12,000 mink, the smallest less than 100. Nutritional disorders, intoxications and infectious diseases are the most important. Outbreaks of botulism caused by Type C or Type E toxin have occurred since 1952. Type C antitoxin only is available. The Swedish botulinus vaccine affords protection only against Type C. At least 6 animals (preferably the first to die) should be sent in for type determination in a suspected outbreak. Feeding of fresh-water fish or garfish (which contain thiaminase) may cause clinical vitamin B_1 deficiency. Sodium chloride deficiency in lactating females causes severe loss of condition; a 0·5% NaCl supplement may prevent this, but sensitivity to NaCl poisoning is emphasized. "Yellow fat" disease in kits can be controlled, if dealt with early, by deprivation of one feed, restricting protein intake, withdrawing oily fish (*e.g.* mackerel) from the diet and providing ample drinking water. Kits should not have too rich a diet in July and August.

Of infectious diseases distemper is the most serious. Because there is no common term in Danish to cover the disease in dogs, foxes, mink, ferrets and raccoons (distemper in mink being termed "hvalpesyge"—whelp disease) some breeders fail to realize the identity of the causal agent with that of dog distemper ("hundesyge") and that adult mink also are susceptible. Cases of the nervous form often occur at the end of a severe outbreak. Suspected cases must be sent to the Serum Laboratory (Copenhagen) for confirmation of diagnosis by demonstration of cytoplasmic inclusion bodies in the epithelium of trachea or urinary bladder. Early vaccination is important, but the incidence after vaccination is variable and some outbreaks continue for several months, morbidity and mortality varying greatly from one outbreak to another.

Weaning is a critical period, anaemia causing much mortality. Mortality from birth to weaning is about 10%. Agalactia responds to injection of 5-10 units of posterior pituitary hormone. Reproductive disorders including early foetal death are discussed.—F.E.W.

JENNINGS, A. R. (1958). **Some causes of death in wild birds in Britain.**—*Vet. Rec.* **70,** 758-760. **1167**

In a survey 800 wild birds (104 species) were examined P.M. The cause of death was determined in 82%, as follows:— trauma 29%; infectious diseases 18%; adverse climatic factors (starvation, chilling, stress) 11%; poisoning 10%; miscellaneous causes (including tumours, pneumonia, inflammation of organs) 10%; parasites 4%. In 18% the cause of death could not be determined.—F.E.W.

SHNEL, K. N. (1957). **I. [Lateral deformation of the carpal joints in racehorses and its effect on performance.] II. [Development of the metacarpus under different loads in horses with lateral deformation of the carpal joints.] III. [Bone changes in the carpus of horses in relation to unequal loads.]** — *Trud. Mosk. vet. Acad.* **19,** No. 1. pp. 3-17; 18-24 & 25-27. [In Russian.] **1168**

I - III. S. studied 241 racehorses and found lateral deformation of the carpus, as manifested by bow-legs, in 48% of Orlov trotters, 54% of Russian trotters and 79% of Thoroughbreds. The proportion of these horses which showed splayed hooves was 7, 17 and 2% respectively. Affected horses running a 1,600 metre course were about 3 sec. slower than normal horses. Radiography revealed that the medial wall of the metacarpus of affected horses was thicker than the lateral wall, as a result of unequal load placed upon it. In the majority (80-90%) of affected horses there was radiographic evidence of arthrosis in the carpus, particularly on the medial side, while only 12–26% of normal horses showed signs of arthrosis of the carpus.—R.M.

NEITZ, W. O. (1957). **Sweating sickness: the present state of our knowledge.**—*Proc. IVth Meet. Interafr. Adv. Comm. Epiz. Dis., Dakar May,* 1957, pp. 43. **1169**

A detailed account of all aspects of the disease, with a bibliography, and a map showing world incidence. Details of the author's experimental work at Onderstepoort are reproduced [see also *V.B.* **27,** 2723].—R.M.

MANDELLI, G. & GERVASINI, C. (1958). Sulla distrofia muscolare lipomatosa degli animali domestici. Osservazioni su due casi (nell'equino e nel bovino). **[Muscular dystrophy in a horse and a bull.]** — *Clin. vet., Milano* **81,** 129-142. [Summary in English.] **1170**

The condition was observed after slaughter in an aged horse (over 16 years) and a bull aged 3 years, both clinically healthy. In the horse there was bilateral involvement of the muscles of the thigh, croup, back, shoulder and neck, with extensive areas of fatty degeneration. In the bull the condition was limited to a small area of the longissimus dorsi on one side of the body. The histological changes are described and hypotheses on the causation of the condition are discussed.—T.E.G.R.

STARKEBAUM, C. C. (1958). **"Bawling disease" in calves.**—*J. Amer. vet. med. Ass.* **132,** 495. **1171**

This disease, observed in Colorado, affects up to 1% of new-born calves. The condition is characterized by weakness (the animal remains recumbent), cyanotic mucous membranes, swollen tongue, low-throated bawling noises, and death within six hours. Patent foramen ovale was observed P.M.—T.E.G.R.

ROSENBERGER, G. & STÖBER, M. (1958). Beurteilung der Behandlung und Vorbeuge der Fremdkörpererkrankung des Rindes mittels Magnet-Instrumenten. **[Magnets for the treatment and prevention of the foreign body syndrome in cattle.]**—*Dtsch. tierärztl. Wschr.* **65,** 57-61 & 98-101. **1172**

Magnetic probes are not considered suitable for treating the foreign body syndrome in cattle, for these reasons: they were successful in only 10 of 126 cases, they induce vomiting, which may cause aspiration pneumonia, and their use precludes examination of the forestomachs. They have a certain diagnostic and prophylactic value, especially when permanent magnets are given first. Of 53 cattle with permanent magnets 32 were freed from foreign bodies by magnetic probes. Permanent magnets are not, however, recommended for long-lived dairy cattle, as opposed to fattening cattle as, in time, they damage the mucous membrane.—M.G.G.

DURAND, M. (1958). Une ostéopathie atrophique chez le chameau: le krafft. **["Krafft", an atrophic disease of bones in camels.]** — *Bull. Acad. vét. Fr.* **31,** 159-160. **1173**

A condensed account of a disease already described in detail. [See *V.B.* **28,** 2950; **29,** 489.]—T.E.G.R.

CHERKASOVA, A. V., SAMORODOV, N. M. & SHEVCHENKO, N. K. (1958). **[Infectious atrophic rhinitis of pigs.]** — *Veterinariya, Moscow* **35,** No. 9 pp. 51-58. **1174**

Atrophic rhinitis was introduced into Uzbekistan by boars imported from other parts of the U.S.S.R. In some piggeries 80–90% of piglets were lost, mainly from diarrhoea which, because it was associated with trichomonads, was regarded as an intestinal form of the disease, affecting piglets 2–7 weeks old. Survivors of the enteritis developed chronic purulent-necrotic rhinitis at the age of 2–3 months. Trichomonads (20–40 μ diameter) were identified in nasal washings from 90% of pigs with rhinitis, and in samples from nasal mucosa, ethmoid bone, trachea, oesophagus and stomach of 27 slaughtered cases. Descriptions of clinical and pathological findings were based on examination of 400 pigs. Trichomonads were present in the mucosa of parts of the large intestine of pigs dying from enteritis. Pure cultures of trichomonads were introduced intranasally into 8 piglets aged a month from rhinitis-free areas, and rhinitis developed in 3 of them. Secondary infection was believed to be responsible for the further development of rhinitis lesions.—R.M.

LARSEN, S. (1958). Nysesygen og miljøet. **[Atrophic rhinitis and environment.]** — *Medlemsbl. danske Dyrlaegeforen.* **41,** 304-311. **1175**

Routine examination of median sagittal sections of the head in slaughter pigs revealed varying degrees of atrophy of the turbinate bones, with or without lesions of the mucosa, or exudation, even in those with no outward deformity of the snout. Of 75 heads of normal appearance examined during September 1957, 43 were so affected, some having total atrophy. Visits to the farms supplying these pigs revealed that, while the vitamin and mineral requirements were supplied by supplements, the main constituent of the diet from weaning to slaughter weight was "corn" (usually barley meal) mixed with water. Skim milk was fed only when available, in quantities varying from "nil" to "plentiful"; usually it was available only in summer. The carbohydrate intake of a 70-kg. pig was about 5 times that of an adult human being on a predominantly carbohydrate diet. Gilts for breeding were generally reared on this unbalanced diet and even then were not fed adequate quantities of milk. L. suggested that atrophic rhinitis could be controlled if farmers could be persuaded to select for breeding as early as weaning time and to rear such gilts separately on a more rational diet.—F.E.W.

BJÖRKLUND, N.-E. (1958). **Atrophic rhinitis of pigs. A morphologic study including some etiologic aspects.**—*Thesis, Stockholm* pp. 100. [In English.] **1176**

B. described in detail the morphology and histology of atrophic rhinitis, based on examination of 15,000 snouts. Three types of the condition were described, occurring in older breeding pigs, fattening pigs (sporadic cases) or in young pigs (the commonest type). There was evidence that the condition could originate in foetal pigs. Atrophic rhinitis was commonest in the more rapidly-growing pigs. B. suggested that the condition may result from a metabolic disturbance or may be caused by abnormally rapid growth. Bacterial infection played a major role in atrophic rhinitis, but the infection was secondary to bone changes. [84 illustrations.]—R.M.

WALLACE, C. R. (1958). **Spontaneous canine congestive failure of circulatory system.**—*Fed. Proc.* **17,** 168. **1177**

The experimental and spontaneous types of congestive failure are compared. Oedema and ascites occur in the latter and hydrothorax is uncommon. In all of three spontaneous cases studied there was oliguria and sodium retention. Both these conditions responded to treatment with sodium-absorbing resin which raised the specific gravity and the sodium level of the plasma and ascitic fluid; the oedema promptly cleared up, but the ascites was more slowly reduced. Venous pressure ranged from normal to 18 mm. Hg.—T.E.G.R.

MAYR, H. (1958). Ergebnisse der intravenösen Cholecystographie beim Hund mittels Biligrafin unter Berücksichtigung des Blutbildes und Harnbefundes. **[Cholecystography in dogs by means of intravenous injection of iodipamide sodium.]** — *Inaug. Diss. Munich* pp. 70. **1178**

The contrast medium iodipamide sodium, injected i/v in doses of 500 mg./kg. body wt. was successfully used for the X-ray demonstration of the gall bladder in dogs. Effects on blood picture and urine were insignificant and of short duration. Vomiting, the only important side effect, was prevented by administration of antiemetics before injection of the contrast medium. —E.G.

SOKOLOFF, L. & HABERMANN, R. T. (1958). **Idiopathic necrosis of bone in small laboratory animals.**—*Arch. Path.* **65,** 323-330. **1179**

Areas of apparently aseptic necrosis of bone were observed in 31 of 670 mice aged 1–2 years. The aetiology is obscure though genetic factors and sex seem to play a part. Similar lesions were observed in a hamster and in some rats. The lesions were complicated by fractures of the neck of the femur, collapse of the epiphyses, kyphosis, or osteosclerosis. Similar lesions were found in the ossicles of the femoro-tibial joints of a large proportion of all the older rats and mice examined.—T.E.G.R.

LÖLIGER, H.-C. (1958). Die interstitielle, pericholangitische Hepatitis (Pericholangitis hyperplastica) beim Huhn. **[Interstitial pericholangitic hepatitis in fowls.]**—*Mh. VetMed.* **13,** 16-19. **1180**

This type of hepatitis was fairly common in fowls and was characterized by cell proliferation in the periportal lympho-reticular tissue. It never resulted in the connective-tissue scarring which occurs in cirrhosis in mammals. It differed from liver lesions of the avian leucosis complex. Pathogenesis and aetiology were discussed.—R.M.

GOROSHKO, I. N. & PROKOF'EVA, M. I. (1958). **[An infectious disease of the respiratory organs of ducks.]**—*Veterinariya, Moscow* **35,** No. 9 pp. 65-69. [In Russian.] **1181**

A disease of ducklings aged 8–45 days occurred in the Ukraine mainly between July and September of each year. During an outbreak, losses increased during the first 15–20 days, remained high for about 15 days, and then rapidly decreased. Mortality was 30–60% of ducklings. Symptoms were sneezing, difficulty in breathing, convulsions lasting 10–15 min. (which often led to drowning); in severe cases the orbital sinuses were swollen. Illness lasted for 2–45 days. The most characteristic lesions were hyperaemia of the nasal mucosa, which had a considerable coating of mucosal exudate, and fibrinous inflammation of the orbital sinuses, which were filled with yellow flakes. The cause of the disease was not yet known, but it could be transmitted by bacteria-free filtrates of mucous membrane from affected birds, particularly when it was inoculated into the trachea. Treatment with antibiotics was recommended. —R.M.

TINYAKOV, G. G., ARSEN'EVA, M. A. & BOCHAROV, M. S. (1958). **[Age changes in structure of testicles of monkey, and their reaction to ionizing radiation.]**—*C. R. Acad. Sci. U.R.S.S.* **122,** 799-801. [In Russian.] **1182**

Changes in the normal histology of testicles between 1 and 7 years of age were described.

Following exposure to 150–400 r of X-rays, normal structure was not completely restored even after two years.—R.M.

JELLINEK, S. (1958). **Immediate effects of irradiation of elastic tissues with X rays, radium, and radioactive cobalt.** — *Lancet* November 29th, pp. 1149-1151. [Author's summary modified.] **1183**

Post-mortem radiation experiments were carried out on the ligamentum nuchae of bovine foetuses and on human skin to study the immediate effects on elastic tissue. X-rays, radium, and radioactive cobalt in quantities ranging from 1 r to 50,000 r were used, and the material was studied histologically. Changes were found in all experiments, and the threshold seemed to lie outside the range examined—i.e., below 1 r.

MAR'ICH, L. N. (1958). **[Changes in alkaline reserve of blood in acute radiation sickness in rabbits.]** — *C. R. Acad. Sci. U.R.S.S.* **120,** 1003-1006. [In Russian.] **1184**

There was a sharp reduction in alkali reserve between 2 and 24 hours after exposure of the animal to lethal and sublethal doses of X-rays. This was of potential value for early diagnosis of radiation sickness.—R.M.

ROSENFELD, G. (1958). **The function and capacity of the adrenal cortex immediately before radiation sickness death.**—*J. Lab. clin. Med.* **51,** 198-210. **1185**

Bull calves were exposed to 600 r of gamma irradiation from cobalt-60 such that the dose rate ranged from 44·3–41·0 roentgens per min. in air at exposure times of 13·5–14·6 min. Several non-irradiated animals were maintained concurrently with controls and injected daily for 8 days with 150 i.u./100 kg. of ACTH (intramuscular). The adrenals of irradiated animals were removed immediately before death and perfused with a well-oxygenated medium to which was added ACTH in order to ascertain the nature and quantity of their corticosteroid output in response to maximal stimulation. The 17-hydroxylated portion of the total corticoids biosynthesized by irradiated adrenals was moderately increased, but a terminal adrenocortical dysgenesis did not occur. Comparison with the adrenals from the ACTH-treated animals indicated that their steroidogenic capacity was not commensurate with their substantial growth. Results suggested that the terms "adrenal exhaustion" and "dysgenesis" may be misleading or inaccurate as currently applied in a variety of clinical conditions arising from irradiation, infections, intoxications, burns and other noxious agents.

—D. S. PAPWORTH.

VAN MIDDLESWORTH, L. (1958). **Iodine-131 fallout in bovine fetus.** — *Science* **128,** 597-598. **1186**

Radio-iodine determinations were made on thyroids of cattle during 5 months after a test nuclear explosion in the U.S.A. Thyroids from 40 pregnant cows and their foetuses and from 400 slaughtered cattle were examined. Thyroids from 85% of 7–9 month foetuses had a greater conc. of radio-iodine than their dams, while the same applied to only 68% of 6–7 month foetuses: thus the relative conc. in the foetus increased as pregnancy advanced. Average radio-iodine content of adult thyroids fell from over 1 mμc/g. at the start of the determinations to 0·01 mμc/g. 2–3 months later.—R.M.

HAWTHORN, J. & DUCKWORTH, R. B. (1958). **Fall-out radioactivity in a deer's antlers.** — *Nature, Lond.* **182,** 1294. **1187**

Antlers were obtained from 2 deer on the island of Islay, Scotland. The first was shot in 1952, the other in November 1957. The radioactivity of the respective antlers was 11·2 and 126 μμc./g. Ca. Exposure of X-ray film to a cross-section gave a dark image of the dense peripheral zone of the 1957 antler, but only a very faint image of the 1952 antler.

X-ray film was blackened by a sheep's premolar from an area where the grass is known to contain high concentrations of radioactive strontium.—M.G.G.

FINKEL, M. P. (1958). **Mice, men, and fallout. The potential danger of strontium-90 is appraised on the basis of data from animal experiments.**—*Science* **128,** 637-641. **1188**

850 mice were given single i/v injections of radiostrontium. A further 150 mice were untreated controls. With doses of between 200 and 2,200 μc/kg. body wt., the primary cause of death was neoplastic disease, while with higher doses it was subacute or acute radiation sickness. The lowest injected dose that significantly decreased the length of life was 44 μc/kg. 600 days after injection, 11% of the initial dose was retained in the body. Neoplasms which could be attributed to radiation were osteogenic sarcomas and haemangio-endotheliomas of bone marrow. The total incidence of leucaemia, lymphoma, and lymphoid, thymic and reticular tissue tumours was not influenced by radiation,

but they appeared earlier in animals that had received 88 μc/kg. or more.

Six dogs and six cats were each given a single i/v inj. of 150 μc/kg. 5 dogs eventually died and 3 of them had osteogenic sarcomas; the sixth dog was still alive and it had no radiographic signs of bone disease. Three of the cats died with haemangio-endotheliomas of bone and the remaining 3 did not develop neoplasms. By extrapolation of the results to man, it was concluded that present contamination with radiostrontium from fallout was very much lower than that required to produce bone tumours or leucaemia.—R.M.

HOLGATE, W., MOLE, R. H. & VAUGHAN, J. (1958). **Accumulation of strontium-90 in dental tissues.**—*Nature, Lond.* **182,** 1294-1295. **1189**

Sr^{90} (100μc per kg.) was injected i/v into 8 rabbits, and the amounts in teeth and femur were assayed at intervals between 8 hours and 180 days later. In teeth the concentration rose for at least 30 days to a maximum of about 0·7 μc, and then fell abruptly as the radioactive layers wore away in mastication. In femur, on the other hand, the concentration decreased steadly from a maximum of 4·6 μc observed 8 hours after injection.—M.G.G.

LISTER, B. A. J. (1958). **The safe disposal of waste from atomic energy establishments.**—*Roy. Soc. Hlth J.* **78,** 498-504. Discussion: pp. 504-506. **1190**

The major waste products from atomic energy establishments and the methods of their disposal in Gt. Britain are described. These methods which depend largely on dilution in the sea and atmosphere, will cease to be adequate as greater use is made of atomic energy. Two new approaches appear promising: (1) chemical separation of the two long-lived fission products, radio-strontium and radio-caesium, from waste which, after 10–20 years' storage, can be disposed of without difficulty; (2) solidification of liquid waste.—M.G.G.

ROEMMELE, O. (1958). Vergleichende Untersuchungen mit Polyphosphaten und mit Natriumzitrat zur Verhinderung der Blutgerinnung für diagnostische Untersuchungen. **[Comparison of polyphosphates and sodium citrate for delaying blood clotting in samples sent for examination.]** — *Mh. Tierheilk.* **10,** 113-117. **1191**

Polyphosphates were superior to sodium citrate in delaying blood clotting. It is recommended that 1 ml. of a 10% aq. soln. be added to 9 ml. of blood. They have also a possible application in the storage of blood for transfusion.—M.G.G.

JUHÁSZ, B. & SZEGEDI, B. (1958). Die Bestimmung des Ammoniakgehalts im Blut. **[Determination of the ammonium content in blood.]**—*Acta vet. hung.* **8,** 81-87. [In German.] **1192**

A photometric microdiffusion method was described. Average values for ammonium were: sheep 136μg./100 ml. blood; dog 96μg.; rabbit 125μg.—R.M.

HELLMEIER, W. (1958). Untersuchungen über die Brauchbarkeit der Natriumoleatprobe in der Tierheilkunde. **[Veterinary applications of the sodium oleate test for serum albumin.]** —*Inaug. Diss., Munich* pp. 24. **1193**

The serum albumin fixation test with sodium oleate of Zirm & Axenfeld (1954) was investigated, using sheep or ox r.b.c as the indicator. Sera from both healthy and diseased dogs, cattle, cats, sheep and horses were tested. It is concluded that this test would be useful in the prognosis of disease in animals.—M.G.G.

POISONS AND POISONING

JESSEN-KLINGENBERG, H. P. (1957). Fütterungsversuche an Rindern mit bleihaltigem Kalk. **[Feeding experiments on cattle with lime containing lead.]** — *Inaug. Diss., Hanover* pp. 59. **1194**

A calcium ammonium nitrate fertilizer, containing 2·4–3·1 mg. Pb/100 g., was suspected of being the cause of lead poisoning in cattle grazing fertilized pastures. The fertilizer was composed of 40% lime and this component, derived from limestone, contained 9–14 mg. Pb/100 g. Four cows were given lime in the food in doses equivalent to 100–500 mg. Pb daily for 14 days. The cows remained healthy and the lead content of blood, liver and bone did not approach toxic levels. Fertilizer was therefore ruled out as the cause of lead poisoning.—R.M.

MORRIS, M. P., CANCEL, B. & GONZÁLEZ-MÁS, A. (1958). **Toxicity of nitrates and nitrites to dairy cattle.**—*J. Dairy Sci.* **41,** 694-696. **1195**

Heavy mortality in two herds was investigated. Nitrate poisoning was suspected because the forage had a high nitrogen content (1·0% potassium nitrate on a dry weight basis) but was

ruled out because in feeding trials forage containing up to 3·0% potassium nitrate caused no ill effects.—T.E.G.R.

PIERSON, R. E. & AANES, W. A. (1958). **Treatment of chronic copper poisoning in sheep.**—*J. Amer. vet. med. Ass.* **133,** 307-311. **1196**

Chronic copper poisoning in 2 flocks of sheep is described. In the first, of 1,500 7-year-old ewes, the cause is thought to have been an imbalance of copper and molybdenum in the pasture grasses. Symptoms appeared after a change from pasture to feeding with hay. Liver assays in 4 ewes revealed 369 to 433 p.p.m. of copper. The second outbreak, in 150 rams, was caused by the high copper content (50 p.p.m.) of brewers' grain pellets which were fed in large amounts for several months. Chemical analysis of the liver of 3 rams revealed 356 to 430 p.p.m. of copper. Losses were stopped by giving each animal daily 50 or 100 mg. of ammonium molybdate and 5 to 15 grains of sodium sulphate in the food.—M.G.G.

LESER, H. H. (1958). Pathologisch-morphologische Untersuchungen bei experimenteller Kaliumvergiftung von Maus und Huhn. **[Pathology of experimental potassium poisoning in mice and fowls.]**—*Inaug. Diss. Munich* pp. 35. **1197**

Details are given of clin. and P.M. findings in 17 mice and 3 fowls poisoned by lethal doses of a soln. of a 40% potash fertilizer, administered by stomach tube.—E.G.

CATCOTT, E. J., MCCAMMON, C. J. & KOTIN, P. (1958). **Pulmonary pathology in dogs due to air pollution.**—*J. Amer. vet. med. Ass.* **133,** 331-335. **1198**

The visceral organs of 51 dogs, 4 months to 18 years old, from two areas of Los Angeles County having contrasting patterns of atmospheric pollution, were examined within 24 hours after euthanasia, and appropriate sections from the tracheobronchial tree were examined histologically. No characteristic or pathognomonic pattern of morphological changes could be detected in the tracheobronchial epithelium, subepithelial glands or in the pulmonary parenchyma—in contrast with characteristic respiratory tract changes induced in other dogs by exposure to a synthetic "smog" in inhalation chambers.—F.E.W.

THAMM, H. (1958). Über die Giftwirkung bestimmter industrieller Produkte bei Haustieren. **[Toxicity of certain industrial products for domestic animals.]** — *Mh. VetMed.* **13,** 526-528. **1199**

The clinical and pathological effects of poisoning with lignite tar pitch, chlorinated naphthalenes, and glycols are summarized briefly, and the dangers of causing avitaminosis and of upsetting the normal bacterial flora of the intestine by feeding antibiotics are discussed. —M.G.G.

DESSAU, F. I., KLEIN, S., LIPCHUCK, L., O'GRADY, J. & TSALIKIS, J. (1958). **Heart lesions in mice caused by treatment with bishydroxycoumarin (Dicumarol).** — *J. Pharmacol.* **124,** 182-187. **1200**

Dicumarol added to diets at levels of from 40 to 200 mg./kg. induced heart muscle lesions in mice resembling those observed after feeding sulphaguanidine. Vitamin E did not modify this effect but vitamin K at twice or menadione at 8 times the conc. of Dicumarol prevented it. —R.M.

ADAMIČ, Š. (1958). Djelovanje gama-izomere heksaklorcikloheksana na kokoš i na patku. **[P.M. findings in ducks and fowls experimentally poisoned with gammexane.]** — *Veterinaria, Sarajevo* **7,** 329-334. [In Croat. Summary in English.] **1201**

The toxic effect of gamma isomer BHC was studied in 36 fowls and 18 chicks, given lethal oral doses of 0·33–1·44 g./kg. body wt. In fowls the onset of gastro-intestinal and nervous symptoms was gradual and death occurred 2–23 days after administration. The P.M. picture included liver and kidney degeneration and ganglion cell lesions. Ducks died a few hours after ingestion. —E.G.

VAN ROOYEN, C. & LOURENS, D. C. (1958). **Preliminary investigations of the chemical and biological aspects of the use of parathion in the eradication of** *Quelea quelea lathami.* — *S. Afr. J. agric. Sci.* **1,** 151-174. [In English. Summaries in Afrikaans and French. Authors' abst. modified.] **1202**

Eradication of quelea finches by aerial spraying with parathion necessitated an urgent investigation of the toxicity of the contaminated vegetation to livestock. The parathion concentration decreased rapidly during the first 7–8 days after spraying, and then much more slowly; seasonal weather conditions affected the rate of decrease, although rain during experimental periods had no apparent effect. Cattle feeding on sprayed vegetation had a high resistance to the toxic effects of parathion. Roasting

or boiling of quelea killed by parathion reduced the parathion concentration in the carcasses to a harmless level.

KOVALEV, G. K. (1957). **[Action of the parasiticide chlorten on animals.]**—*Trud. Mosk. vet. Akad.* **19,** No. 1. pp. 356-371. [In Russian.] **1203**

Chlorten is stated to be similar to toxaphene [see also *V.B.* **27,** 2728]. Given by mouth, the toxic dose was 0·15 g./kg. body wt. for rabbits and 0·5 g./kg. for sheep, while the lethal dose was 0·4 g./kg. for rabbits and 1 g. per kg. for sheep. Sheep tolerated dipping in 0·5-3% emulsion but developed toxic symptoms after being dipped in 5% emulsion. Symptoms were increases in reflex responses, staggering, convulsions, reduction in body temp., cardiovascular, respiratory and digestive disturbances, polyuria and proteinuria. In the blood there were leucocytosis, neutrophilia, and fewer lymphocytes.—R.M.

EVDOKIMOV, P. D. (1957). **[Clinical symptoms and treatment of horses poisoned by *Ranunculus sceleratus*.]**—*Sborn. Rabot Leningrad. vet. Inst.* No. 16 pp. 20-23. [In Russian.] **1204**

E. observed 22 cases of poisoning among emaciated horses in the period 1942–1944. Poisoning could be reproduced experimentally in emaciated horses by feeding between 2 and 2·7 kg. of the fresh plant with hay over 3–5 days. The plant did not appear to be very palatable. The principal symptoms were pale or bluish mucous membranes, diarrhoea, attacks of colic, haematuria, dilated pupil. Later there were ataxia, increased thirst, and inappetence. A well-fed horse developed mild poisoning after ingesting 3·5 kg. of the plant over 10 days. Effective therapy consisted of i/v inj. of 150 to 250 ml. 10% soln. sodium thiosulphate, twice daily for 3 days, and irrigation of the stomach with 0·1% potassium permanganate soln., followed after 45 min. by castor oil.—R.M.

SCHAMPER, A. (1958). Die chronische Seneciovergiftung im Rattenexperiment (*Senecio vulgaris, S. jacobaea, S. paludosus*). Ein Beitrag zur Histogenese der fütterungsbedingten Leberzirrhosen und Lebergeschwülste beim Tier. **[Liver lesions in rats with chronic senecio poisoning.]** — *Inaug. Diss. Munich* pp. 53. **1205**

In an experiment lasting 280 days, the hepatotoxic effect of dried and powdered *Senecio vulgaris, S. jacobaea* and *S. paludosus* was confirmed in six groups of rats fed these plants, collected either before or after flowering. It is possible that senecio alkaloids may have a carcinogenic effect if given orally over a long period.—E.G.

FORSYTH, D. M. (1958). **Visual disturbances associated with trivalent antimony salts. A report of two cases.**—*Brit. med. J.* November 22nd, 1272-1273. [Author's summary.] **1206**

Two cases of optic neuropathy associated with visual disturbances and indefinite fundus changes are described as occurring during or following a course of injections with trivalent antimony compounds. The association has not been previously reported.

The patients developed symptoms within a few days of each other, and an infective basis cannot be excluded.

See also abst. **1038** (concurrent anaplasmosis and copper poisoning in sheep).

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

ORDUINSKII, S. I. (1957). **[Pharmacological study of furamon in horses and cattle.]**—*Sborn. Rabot Leningrad. vet. Inst.* No. 16 pp. 110-114. [In Russian.] **1207**

Furamon is described as trimethyl-furfuryl-ammonium iodide. The authors tested the action of therapeutic doses (30–40 mg. s/c) on 7 horses and 2 cows. They concluded that the substance was indicated in atony of the gastro-intestinal tract and also in hyposecretion of the digestive glands.—R.M.

DALTON, P. J. (1958). **Beta-ray therapy in veterinary practice.** — *Vet. Rec.* **70,** 233-235. **1208**

The types of beta-rays which appear most suitable for use in veterinary practice are those emitted by Sr^{90} and P^{32}; the latter, however, has a very short life. The Sr^{90} applicator used is described and indications for beta-ray therapy, radio-sensitivity of tissues, dosage rates and results of 19 cases treated are discussed.—T.E.G.R.

MUTOVIN, V. I. (1958). **[Contemporary methods of using antibiotics in veterinary medicine.]** pp. 156. Moscow: Gosud. izd. sel'skokhoz. literatury. 2r. 10k. (2s. 6d.) [In Russian.] **1209**

This monograph briefly describes the anti-

biotics now used in the U.S.S.R. and the diseases in which they have been used. It is a review of the literature, Russian and non-Russian. The antibiotics are penicillin, streptomycin, chloramphenicol (sintomycin or levomycetin), chlortetracycline (biomycin), oxytetracycline (terramycin), albomycin (Gauze & Brazhnikova, 1951), gramicidin C, and microcide (mikrotsid), a new drug.—R.M.

FINLAND, M. [Edited by.] (1958). **The basic and clinical research of the new antibiotic, kanamycin.**—*Ann. N.Y. Acad. Sci.* **76,** 17-408. **1210**

Kanamycin was first isolated in Japan from a species of *Streptomyces* and is chemically related to neomycin. This publication contains 38 papers on the pharmacology and therapeutic applications of this antibiotic. It has been used in human medicine for intestinal antisepsis and for the treatment of tuberculosis, chronic infection of the urinary tract, staphylococcal infections and other conditions. It should be used with caution because of toxic action on the kidneys and the eighth cranial nerve. There is no mention of it having been used in veterinary medicine.—R.M.

APTER, J. T. (1958). **LSD-25 versus pentobarbital sodium.**—*Fed. Proc.* **17,** 5. **1211**

Results of experiments on cats given large doses of nembutal i/p and treated i/p with LSD–25 [lysergic acid diethylamide] are taken to indicate that LSD–25 may be of value in the prevention of death from barbiturate poisoning in lab. animals and as an analeptic in man.—T.E.G.R.

WINTZER, H. J. (1958). Die Allgemeinnarkose beim Schwein. **[General anaesthesia in pigs.]** —*Tijdschr. Diergeneesk.* **83,** 651-661. [In German. Summaries in English, French and Dutch.] **1212**

A review with reference to pentobarbitone, hexobarbitone, methitural, "Eunarcon", "Rapidorm" and premedication with chlorpromazine.—R.M.

EMBREY, M. P., GARRETT, W. J. & PRYER, D. L. (1958). **Inhibitory action of halothane on contractility of human pregnant uterus.**—*Lancet* November 22nd, 1093-1094. [Authors' summary modified.] **1213**

Tocographic records demonstrating the effect of fluothane anaesthesia on the contractility of the human pregnant uterus were obtained in 12 patients. In each, uterine contractility was clearly inhibited, with obliteration of both spontaneous and oxytocin-induced contractions. The inhibitory effect was rapidly produced at a light plane of anaesthesia and quickly disappeared when consciousness was recovered.

See also absts. **914-916** (antibiotic resistance of staphylococci and streptococci); **943** and **969** (disinfectants); **944-945** (action of antibiotics on corynebacteria); **946** (sulphonamides in glanders); **958** (treatment of bovine kerato-conjunctivitis); **1026** (infectious ovine agalactia); **1032** (chlortetracycline in avian coccidiosis); **1035** (pyraldin and haemosporidin in piroplasmosis); **1037** (spirotrypan in anaplasmosis); **1058** (isoniazid in encephalomyelitis); **1090** (spiramycin in psittacosis); **1103-1105** (systemic insecticides); **1106 & 1108** (parasiticides); **1111 & 1112** (anthelmintics); **1269** (veterinary vademecum); **1270** (disinfection and sterilization).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

HARKER, J. E. (1958). **Diurnal rhythms in the animal kingdom.**—*Biol. Rev.* **33,** 1-52. **1214**

H. discussed the effects of continuous light or darkness, feeding, barometric pressure, temperature, population and other diurnal factors on representatives of the entire animal kingdom. There is little reference to mammals other than some lab. animals and rodents.—R.M.

TUM-SUDEN, C. & STOUFER, R. M. (1958). **The effect of atropine upon skeletal muscle in the goat with myoclonia congenita.**—*J. Pharmacol.* **124,** 142-148. **1215**

Intra-arterial injection of 0·1–1 mg. atropine promptly reduced the isometric twitch tension of striated muscle in anaesthetized goats with congenital myoclonia, and rapid recovery followed. But in goats not anaesthetized there was no apparent functional benefit from intra-arterial atropine. The cholinesterase content of normal and myoclonic muscle did not differ much.—R.M.

ALLBROOK, D. B., HARTHORN, A. M., LUCK, C. P. & WRIGHT, P. G. (1958). **Temperature regulation in the white rhinoceros.** —*J. Physiol.* **143,** No. 2. pp. 51P-53P of Proceedings. [Authors' abst. modified.] **1216**

The adult white rhinoceros, *Ceratotherium simum,* probably weighs about 3,000 kg. Its habitat includes intensely hot parts of Africa. The temperature regulation of a male and a female from the Uganda–Sudan border was investigated.

Rectal and skin temperatures were taken with thermistors. The pulse rate was counted at the caudal artery. Rectal temperatures at sunrise were about 34·5°C., rising gradually during grazing in the sun to 37·5°C. by sunset (air temp. around 25°C. and r.h. 75%). When kept

in the shade all day the rectal temp. remained at 35·2°C. On returning from a wallow the rectal temp. was 35·4°C. The night ambient temperature during the investigation fell to 5°C. for five or six hours, but 33·6°C. was the lowest rectal temp. recorded.

The skin is well adapted for temperature regulation, having an epidermis about 1 mm. thick, with a well-developed subjacent vascular bed. The dermis, about 2 cm. or more thick, is dense, collagenous and relatively avascular, pierced at intervals by vessels to the epidermis. Beneath the epidermis lie large and numerous sweat glands with well-developed myo-epithelial cells. No signs of sweating were observed with the quinizarin–sodium carbonate–starch method. After prolonged exertion sweat is said to appear.

The pulse rate at rest varies from 30 to 40 per min., the higher figure in the afternoon.

A comparison of these studies with those of Benedict (1936) on the elephant show that the rhinoceros has a greater diurnal temp. variation, the elephant varying little from a mean rectal temp. of 35·9°C. by day or night; Benedict does not mention the environmental temperature but remarks that his elephant tolerated cold.

SADCHIKOV, S. I. (1957). **[Effects of air temperature and sunshine on pigs.]**— *Trud. Novocherkassk. zootekh.-vet. Inst.* No. 10 pp. 99-108. [In Russian.] **1217**

Skin temp. of the spine, flank and abdomen was measured by thermocouples in summer and winter inside and outside piggeries in young and adult pigs. The results were tabulated with data on air temp., humidity and rectal temp. Heat loss was greatest from the abdomen. Black pigs grew better at high temp. than white pigs and were better adapted to pasturing during hot days. Because black pigs absorbed nearly twice as much sunlight as white pigs, it was suggested that their resistance to disease would be greater. —R.M.

SLEN, S. B. (1958). **Effect of trauma on wool growth.**—*Nature, Lond.* **182,** 1322. **1218**

Wool fibres from thickened areas of the skin caused by the sheep striking itself on the shoulder when entering the feeding pen were longer and thicker than fibres from the surrounding skin. It is suggested that wool growth was stimulated by an increase in blood supply to the site of injury.—M.G.G.

DENTON, D. A. (1958). **The effect of variation in the concentration of individual extracellular electrolytes on the response of the sheep's parotid gland to Na^+ depletion.**—*J. Physiol.* **140,** 129-147. **1219**

This paper deals with changes which occur in the extracellular fluid as a result of sodium depletion, and with experimental procedures designed to identify the stimulus to the hypothetical receptor determining the parotid response during sodium depletion. The principal result is that the salivary Na : K ratio falls in response to Na deficit, even though concurrent water depletion causes plasma sodium to rise. Neither the neurohypophysis nor the thyroid gland played any part in the response of the parotid to Na depletion.—R.M.

NEFEDOVA, R. S. (1957). **[Effect of exercise at an early age on the physiological condition of calves.]**—*Trud. Mosk. vet. Akad.* **19,** No. 1. pp. 67-76. [In Russian.] **1220**

It was claimed that daily exercise improved appetite, diminished the incidence and severity of gastro-intestinal disorders and increased weight gain. It increased the haemoglobin content, alkali reserve and catalase activity of blood, and led to increased respiratory exchanges and heat production. The period of daily exercise increased from 15 min. at 3 days of age to 3 hours at 3 months, provided the temp. was not less than −15°C. and there was not a cold wind.—R.M.

STEPANOVA, E. N. (1957). **[Effect of exercise on the gas and energy metabolism and yield of lactating cows.]**—*Trud. Mosk. vet. Akad.* **19,** No. 1. pp. 77-84. [In Russian.] **1221**

During winter housing, 7 lactating cows were exercised over a distance of 2·5 km. morning and afternoon. Average oxygen consumption, CO_2 excretion and heat production were higher than in 7 cows housed all the time and food consumption, milk yield and fat content of the milk were increased.—R.M.

HARDWICK, D. C., LINZELL, J. L. & TUCKER, E. M. (1958). **The blood flow and milk yield of goats' udders perfused with artificial media.**—*J. Physiol.* **143,** No. 2. pp. 74P-75P of Proceedings. [Abst. from authors' abst.] **1222**

Udders, removed under epidural anaesthesia and chlorpromazine, were perfused for 8–10 hours with sterile suspension of washed goat r.b.c. in 5–7% goat albumin in Krebs-Henseleit solution with penicillin and streptomycin.

As in cows' udders perfused with whole blood (Tindal, 1957), the rate of milk secretion steadily declined to very low levels during the

first 3 hours and in all no more milk was produced than was secreted in one hour before the experiment (average of several days). However, when a substrate–hormone mixture containing 19 amino-acids, glucose, acetate, β-hydroxybutyrate, phosphate, calcium, growth hormone, thyroxine, insulin and tissue culture fluid no. 199 of Morgan, Morton & Parker was used, the rate of milk secretion rose to 70% of normal at 2–3 hours and declined slowly thereafter. In all, during a 10-hour experiment up to 37% of the expected milk (of normal composition) was obtained.

SETNIKAR, I. & BARRON, D. H. (1958). **Maternal–fetal nitrogen exchange in the goat.** — *Abstr. Commun. IVth int. Congr. Biochem., Vienna* (*Int. Abstr. biol. Sci. Suppl.*) p. 162. [Authors' abst. modified.] **1223**

Determinations were made of the amino, urea and plasma protein nitrogen of the arterial and uterine venous bloods of pregnant and non-pregnant goats and of the foetal bloods of the umbilical artery and vein respectively. In animals 67 days or more pregnant, amino nitrogen is lost by the maternal blood and gained by the foetal blood as they pass respectively through the uterus and placenta. Urea is lost by the foetal blood in the placenta in foetuses of 90 days gestation age and older, but a regular rise in its concentration in the maternal blood perfusing the uterus was not demonstrated. No evidence was obtained to support the view that maternal plasma protein nitrogen is utilized in the growth of the tissues of the uterus or foetus during gestation.

KAISER, I. H. & CUMMINGS, J. N. (1958). **pH, carbon dioxide, oxygen, hemoglobin and plasma electrolytes in blood of pregnant goats and their fetuses.** — *Amer. J. Physiol.* **195,** 481-486. **1224**

The authors were unable to support the observation of Keys [*J. Physiol.* **80,** 491 (1934)] that the goat foetus had a higher blood pH than its mother, but found instead relationships similar to those previously observed in sheep. There were, however, differences in electrolytes in the blood of the two species.—R.M.

ANNISON, E. F. & LEWIS, D. (1958). **The thyroxine-binding proteins of sheep in pregnancy.**—*Biochem. J.* **68,** No. 3. p. 29P of Proceedings. **1225**

Although it has been reported that the content of thyroxine-binding protein in human sera increased greatly during pregnancy, no such increase was found in pregnant sheep. 100 ml. of sheep sera bound 12–16 μg. of thyroxine. —R.M.

BRENON, H. C. (1958). **Further erythrocyte and hemoglobin studies in Thoroughbred racing horses.**—*J. Amer. vet. med. Ass.* **133,** 102-104. [Author's summary modified.] **1226**

In a study of 359 clinically normal Thoroughbred racehorses of both sexes, the average findings in whole blood were: r.b.c., 6·9 million per ml.; haemoglobin concentration, 14 g. per 100 ml.; packed cell volume (PCV), 43 mm.

Combined evaluation of this and a previous study on 207 Thoroughbred racehorses indicated an average normal r.b.c. count of 6·84 million per ml.; average normal Hb conc. 13·86 g. per 100 ml.; and average normal PCV 43 mm. B. considered that a r.b.c. count below 6·5 million per ml.; a Hb conc. below 13 g. per 100 ml.; and a PCV below 40 mm. would indicate that the horse is below its potential physiological peak.

GIBERT, P. (1958). Quelques constantes normales du sang de mouton. **[Some normal constants of the blood in sheep.]**—*Rev. Méd. vét.* **109,** 231-237. [Summary in English.] **1227**

Blood values were studied in clinically healthy sheep in each of 3 age groups: 2–12 months, 1–3 years and over 3 years.—T.E.G.R.

SCHULZE, W., CHRISTOPH, H.-J. & HIEPE, T. (1958). Hämatologische Untersuchungen bei gesunden Schafen verschiedener Rassen. **[Haematological studies on healthy sheep of different breeds.]** — *Dtsch. tierärztl. Wschr.* **65,** 125-131. **1228**

Two blood samples from each of 40 female and 11 male sheep of 6 different breeds were examined for cell count, differential count, haemoglobin content and sedimentation rate. Results were given in the form of tables and graphs.—R.M.

EVANS, J. V., HARRIS, H. & WARREN, F. L. (1958). **The distribution of haemoglobin and blood potassium types in British breeds of sheep.**—*Proc. roy. Soc.* Ser. B. **149,** 249-262. [Authors' summary modified.] **1229**

The incidence of haemoglobin types A, B and AB, and of the high- and low-potassium blood types was determined in 33 breeds. There was no correlation between the haemoglobin types and the potassium types within the breeds. The gene frequencies at the two loci associated

with these characters were estimated for each breed; there was considerable variation at both loci from breed to breed. When different breeds were compared, a marked correlation was found between the haemoglobin A gene frequency and the high-potassium gene frequency. [See also *V.B.* **29**, 555.]

SONI, B. K. & AGGARWALA, A. C. (1958). **Studies in the physiology of the camel (*Camelus dromedarius*). Part I. Cellular blood constituents.**—*Indian vet. J.* **35**, 209-214. **1230**

In 95 adult Indian camels, the average blood haemoglobin, erythrocytes, total leucocytes, lymphocytes and neutrophiles were: 15·52 ± 2·43 g.%, 8·2 ± 2·22 million per cu. mm., 20,070 ± 3,580, 46·0 ± 9·7%, and 38·7 ± 8·8%, respectively.—R. N. MOHAN.

LINMAN, J. W., BETHELL, F. H. & LONG, M. J. (1958). **The erythropoietic stimulatory activity of batyl alcohol.**—*J. Lab. clin. Med.* **52**, 596-604. [Authors' summary modified.] **1231**

Batyl alcohol stimulates erythropoiesis in normal rats. The response appears to be one of accelerated erythroblastic cellular division without associated augmentation in haemoglobin synthesis and is manifested by microcytes with decreased osmotic resistance, reticulocytosis, and myeloid erythrocytic hyperplasia.

The similarities in chemical, physical, and physiological characteristics of batyl alcohol and the thermostable, ether-soluble plasma erythropoietic factor indicate that they may be the same or closely related compounds.

Batyl alcohol also stimulates thrombopoiesis and probably granulopoiesis.

It is suggested that all aspects of myelopoiesis may be under the influence of humoral regulative mechanisms and that batyl alcohol, produced in yellow bone marrow, may be of primary importance in such a system.

BOOTH, N. H., WILL, D. H., MOSS, L. C. & SWENSON, M. J. (1958). **An electrical apparatus and its application in defibrillating the heart of the dog.**—*J. Amer. vet. med. Ass.* **132**, 117-122. **1232**

The apparatus consists of a variable transformer with a range of 0–100 volts, an ammeter with a range of 0–5 amperes and brass electrodes, 8 cm. in diameter and 0·83 mm. in thickness. It operates on 110–115 volt alternating current of 60 cycles per sec. The transformer control is set between 70 and 90 volts. To prevent epicardial and myocardial burning the electrodes are covered with gauze soaked in saline soln. An electrode is placed on each side of the heart and the switch is turned on and off, delivering a shock lasting only a fraction of a second. This allows 2 or more amperes of current to flow through the myocardium, which is sufficient to stop fibrillation. Results of experiments on 21 dogs are given and resuscitative measures are discussed.—T.E.G.R.

FELGNER, K. (1957). Anatomisch-histologische Betrachtung über den vorderen Verdauungsweg von Lutreola vison. **[Anatomy and histology of the anterior digestive tract of mink.]**—*Inaug. Diss. Hanover* pp. 64. **1233**

F. described the normal structure of the mouth, salivary glands, oesophagus and stomach of mink.—R.M.

PUROHIT, M. S. & SINGH, B. (1958). **The poll glands in camel.** — *Indian vet. J.* **35**, 296-298. **1234**

The poll glands, present in the adult male and active during the rutting season (winter), comprised two large aggregations of tubuloalveolar glands opening into minute pits on the skin between the tufts of hair.—R. N. MOHAN.

KOROLEVA, A. A. (1957). **[The thoracic section of the sympathetic trunk in pigs.]**—*Uchen. Zap. Vitebsk. vet. Inst.* **15**, 178-183. [In Russian.] **1235**

An anatomical study of 60 pigs of different breeds and ages. There was great variation in the structure of the thoracic part of the sympathetic trunk. In most cases (81%) there were 11-13 ganglia which did not correspond to the vertebral segments. The size of the ganglia ranged from 0·5 to 5 mm.—R.M.

NÜSSEL, M. (1957). Zur Histologie und Histopathologie des Ganglion stellatum und mesenteriale craniale des Rindes. **[Histology and histopathology of the stellate and anterior mesenteric ganglia of cattle.]**—*Inaug. Diss. Hanover* pp. 81. **1236**

N. studied histological sections of the ganglia from 10 healthy cattle and 10 with chronic traumatic reticulo-peritonitis. Degenerative changes associated with the latter condition were described.—R.M.

IRSKAYA, E. M. (1957). **[Sensory innervation of sympathetic ganglia supplying seminal vesicles and prostate gland of the bull.]** — *Trud. Novocherkassk. zootekh.-vet. Inst.* No. 10 pp. 169-174. [In Russian.] **1237**

The morphology of nerve endings was described and illustrated.—R.M.

AZARNOFF, D. L. (1958). **Species differences in cholesterol biosynthesis by arterial tissue.**—*Proc. Soc. exp. Biol., N.Y.* **98,** 680-683. [Author's summary modified.] **1238**

Human aorta and coronary artery, and the aorta of dogs, cats and rats, were incapable of incorporating radiocarbon-labelled acetate into cholesterol; aorta of g.pigs, rabbits and fowls accomplished this conversion.

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

See absts. **948-931** (E. monocytogenes in milk and meat); **970–971 & 974** (infected meat as source of human salmonellosis).

REPRODUCTION AND REPRODUCTIVE DISORDERS

SCOTT, J. V. & HARDENBROOK, H. J. (1958). **Studies on the use of Illini variable temperature semen diluent in beef cattle.**—*J. Amer. vet. med. Ass.* **133,** 432-434. [Authors' summary modified.] **1239**

After storage of bull semen at 7°C. in a diluent described by VanDemark & Sharma [*V.B.* **28,** 1258] the spermatozoa remained progressively motile for 7-35 days; semen from 6 bulls was used for insemination of 113 cows after storage for 1-26 days. There was considerable variation among bulls in the time for which semen could be stored and retain fertility. With up to 7 days' storage the average conception rate was 63·2%. A few pregnancies resulted with semen stored from 8–14 days; one pregnancy resulted with semen stored for 22 days.

MACPHERSON, J. W. (1958). **The fertility of frozen bovine semen packaged under carbon dioxide.**—*J. Amer. vet. med. Ass.* **133,** 431-432. **1240**

Packing in ampoules under CO_2 gas adversely affected fertility as compared with packing under air.—F.E.W.

LAKE, P. E., SCHINDLER, H. & WILCOX, F. H. (1959). **Long distance transportation of fowl semen by air.** — *Vet. Rec.* **71,** 52-53 & 54. [Authors' summary modified.] **1241**

Fowl semen was flown from the University of Maryland, U.S.A., to Israel (38 hours) and Scotland (37). An account is given of the method used to dilute and transport the semen, and the good fertility results obtained during the first week after insemination.

WEIL, A. J. & FINKLER, A. E. (1958). **Antigens of rabbit semen.**—*Proc. Soc. exp. Biol., N.Y.* **98,** 794-797. [Authors' conclusions and summary modified.] **1242**

Comparison shows a close similarity in the immunological properties of seminal products of man and rabbit. In both species, seminal plasma and spermatozoa contain powerful antigens, so closely related that they have resisted differentiation. These antigens are highly species and organ specific. Such cross-reactions as could be obtained by the agar diffusion method, are due to one of the 5 components demonstrable by this procedure. Data from human semen specimens lacking spermatozoa suggested that the antigenic material does not originate in the spermatozoa. This view is strengthened by the low degree of cross reactivity of rabbit sera with extracts from testes and epididymis, and by evidence that extracts of seminal vesicle wall contain some antigenic components reactive with anti-seminal plasma and anti-spermatozoal immune sera. The seminal vesicle fluid of the rabbit contains in abundance nearly all antigenic components demonstrable with the immune sera available. The effective antigens in seminal plasma and spermatozoa appear to originate in the seminal vesicle.

KARRAS, W. (1958). Spermastudien. 7. Mitteilung. Über eine Methode zur färberischen Darstellung der Doppelstruktur der galea capitis der Bullenspermien. **[Studies on spermatozoa. VII. A staining method for demonstration of the structure of the galea capitis in bull spermatozoa.]**—*Berl. Münch. tierärztl. Wschr.* **71,** 145-147. [Summary in English.] **1243**

A staining method is described, whereby it can be demonstrated that the galea capitis of the bull spermatozoon consists of two parts.

—M.G.G.

HAFEZ, E. S. E. (1958). **Techniques of collection and transplantation of ova in farm animals.**—*J. Amer. vet. med. Ass.* **133,** 506-512. [Author's summary modified.] **1244**

The transplantation of fertilized ova from superovulated donor females of the large animal species to inferior females of the same species may become a practical, commonly used procedure.

Several methods and techniques for the transplantation of ova in cattle and sheep are described and discussed.

For the practical application of ova transplantation, research work is needed for the syn-

chronization of ovulation in relation to oestrus and on antibiotic administration to combat pyometra resulting from ova transplantation *per vaginam*.

I. Fernandez-Cano, L. (1958). **Effect of increase or decrease of body temperature and hypoxia on pregnancy in the rat.**—*Fertil. & Steril.* **9,** 455-459. **1245**

II. Fernandez-Cano, L. (1958). **Effect of changes in body temperature on pregnancy in adrenalectomized rats.**—*Ibid.* 460-463. **1246**

I. A change of body temp. from 99°F. to 104° or to 91° in 5 hours for 2 consecutive days during early pregnancy induced embryonic degeneration mainly before implantation, whereas hypoxia at 410 mm. Hg barometric pressure induced embryonic degeneration mainly after implantation especially at the late stage of embryonic development.

II. In adrenalectomized rats given deoxycortone acetate, change in body temp. or hypoxia did not influence the incidence of embryonic degeneration.—R.M.

Cuboni, E. (1958). Neuere Hinweise zur Ausführung der Trächtigkeitsdiagnose bei der Stute. [**Pregnancy diagnosis in mares.**]—*Berl. Münch. tierärztl. Wschr.* **71,** 108-110. **1247**

A method of purifying the benzene extract of mare's urine in the Cuboni test is described. The technique is the same as that described previously (Cuboni, 1952), but larger quantities of urine (100 ml. instead of 15) and of reagents are used. The method was employed in 38 cases that were doubtful to the Cuboni test, and gave unequivocal positive or negative results.—M.G.G.

Velle, W. (1958). **Studies on oestrogens in cattle. Urinary oestrogen excretion by the newborn calf.**—*Acta endocr., Copenhagen* **29,** 381-394. [In English. Author's summary modified.] **1248**

During the first five days of life the average total excretion of male and female calves was respectively 0·23 and 0·24 mg. of oestrone and 3·3 and 2·3 mg. of oestradiol-17alpha. The problem of the origin of these oestrogens was briefly discussed.

Velle, W. (1958). **Further investigations on urinary oestrogen excretion by the boar.**—*Acta endocr., Copenhagen* **29,** 395-400. [In English. Author's summary modified.] **1249**

Quantitative determinations were made on urinary oestrogen excretion by 10 adult, fertile boars. The average values were 1·6 mg. oestrone and 0·86 mg. oestradiol-17beta per litre of urine a day. Great variations were observed in each animal and between animals.

Armstrong, D. T. & Hansel, W. (1958). **Alteration of the bovine estrous cycle with oxytocin.**—*Fed. Proc.* **17,** 6. **1250**

Heifers with a normal oestrous cycle were treated with oxytocin once daily for 7 days from the first day of oestrus. All returned to oestrus 1-4 days after the end of treatment. When treatment was started on the 15th day after oestrus all heifers came into oestrus at the normal time. Treatment was carried out over a further 7 days; the heifers came into oestrus 2-3 days after the end of treatment. In all animals induced oestrus was followed by ovulation. The two oxytocin preparations used were free from gonadotrophic hormone and results are taken to indicate that the secretion of gonadotrophic hormone by the anterior pituitary is regulated by oxytocin or a closely allied substance.

—T.E.G.R.

Gordon, I. (1958). **The use of progesterone and serum gonadotrophin (P.M.S.) in the control of fertility in sheep. I. The hormonal augmentation of fertility in the ewe during the breeding season. II. Studies in the extra-seasonal production of lambs.**—*J. agric. Sci.* **50,** 123-151 & 152-197. **1251**

I. Field trials with P.M.S. (purified, freeze-dried or whole serum) were carried out over four breeding seasons. The ability of ewes to conceive was not affected by treatment. There was a significant increase in fertility, apparently depending on the dose, the form of P.M.S. used, and the fertility status of the sheep—the increase was greatest where flock fertility was very low. The lambing rate for ewes conceiving at treatment oestrus was 1·81/ewe compared with 1·51 for controls. Of treated ewes conceiving to first service 35·5% produced singles, 51·6% twins, 9.7% triplets, 2·6% quadruplets and 0·6% five or more. Of the controls 51·4% produced singles, 46·2% twins and 2·4% triplets. Litter size was affected by the dose. Lamb mortality for treated ewes was 6·5% in singles, 10·5% in twins, 20·9% in triplets, 38·9% in quadruplets and 90·6% in quintuplets; for controls it was 6·4% in singles, 9·3% in twins and 13·9% in triplets. Such mortality reduced lambing rates from 1·63 to 1·40 for treated ewes and from 1·38 to 1·26 for controls. Lamb survival was observed for two weeks after lambing. In the treated group the lambs/ewe rates were 1·65 at birth, 1·39 at one day and 1·34 at 2 weeks. In the controls they were 1·37, 1·24 and 1·21.

In Welsh Mountain sheep P.M.S. plus progesterone caused synchronization of oestrus in a high percentage and an increase over controls in the percentage of sheep producing multiple lambs. These results are discussed in relation to the practical possibilities of this treatment under conditions obtaining in Gt. Britain.

II. In the course of four non-breeding seasons (1953–56) six series of experiments were carried out with 1,504 ewes. In the first series the object was to provide data on oestrus response, on ovulation rates, on fertilization of ova and implantation of ova in anoestrous ewes after treatment with various combinations of progesterone and P.M.S. The next two sets of trials were concerned with autumn lamb production and with early lamb production. The fourth series relates to the reproductive performance of ewes that produced lambs in September, October and November of 1953 and 1954, and which were lactating in the breeding season. In the fifth series experiments were concerned with the rate of weight gain in autumn lambs and with mortality (during the growing period) among lambs born in October of 1953 and 1954. Finally, experiments were carried out to improve the conception rate of anoestrous ewes by a modification of the hormonal treatment hitherto employed; ram fertility was also investigated. Data on problems associated with extra-seasonal production are also discussed. These papers contain much interesting information and should be read in the original.—T.E.G.R.

VANDEPLASSCHE, M. & BOUCKAERT, J. H. (1958). Belgium. Comite voor steriliteitsbestrijding veeartsenijschool—Gent. **[Committee for sterility control, Ghent Veterinary School. Annual report for 1957.]** — *Vlaams diergeneesk. Tijdschr.* **27,** 58-67. [In Flemish. Summary in English.] **1252**

Subjects studied included fertility of cows after retention of placenta; fertility of mares after caesarian section; related vibrios from pigs and cattle [see also *V.B.* **28,** 2780]; cross-agglutination in vibriosis and trichomoniasis, experimental infection of heifers with *V. fetus* during pregnancy; treatment of bulls infected with *V. fetus*. Investigations concerning pigs included sterility in sows: absence of oestrus in gilts; and artificial insemination. On the last-named, F. Paredis described a diluent for boar semen and reported the results of 150 inseminations.—R.M.

JOHNSON, K. R., FOURT, D. L., ROSS, R. H. & BAILEY, J. W. (1958). **Hereditary congenital ataxia in Holstein-Friesian calves.**—*J. Dairy Sci.* **41,** 1371-1375. [Authors' summary modified.] **1253**

8 calves with spastic symptoms were found in two related herds of Holstein-Friesian cattle in 2 years. The symptoms were first apparent at about 6 weeks of age and were similar in all cases. Both sexes were affected. A certain bull appeared in the pedigrees of both the sire and dam of all the affected calves. It is postulated that the ataxia is due to an autosomal recessive gene. Ataxic calves ceased to appear when bulls known to be carriers were culled. The anatomical basis of the condition was neuronal degeneration and cerebellar hypoplasia.

BREUER, G. H. (1957). Erbanalytische Erhebungen hinsichtlich der Hornhauttrübung bei Kälbern. **[Hereditary factors in corneal opacity in calves.]** — *Inaug. Diss. Hanover* pp. 40. **1254**

B. studied in detail congenital blindness in two herds of Black Pied Lowland cattle, first described by Rosenberger [*V.B.* **26,** 1047]. Incidence was restricted to certain blood lines. Inheritance was apparently a recessive process. —R.M.

JAKWAY, J. S. & YOUNG, W. C. (1958). **An inherited spermatogenic hypoplasia in the guinea pig.** — *Fertil. & Steril.* **9,** 533-544. [Authors' summary modified.] **1255**

The defect ranged from germinal aplasia in most of the seminiferous tubules to a slightly subnormal state in which the germinal epithelium appeared normal, but spermatozoa in the epididymis were massed singly rather than in extensive rouleaux formation. Between 30 and 50% or related males were affected.

See also abstr. **1001** (L. pomona in bull semen); **1009-1017** (vibriosis); **1028** (bact. flora of semen and prepuce in boars); **1066-1067** (bovine vulvo-vaginitis); **1092** (virus diseases of embryos and foetuses); **1237** (innervation of seminal vesicles and prostate in bulls); **1271** (book, reproductive physiology); **1272** (book, veterinary obstetrics).

ZOOTECHNY

SHOL'TS, S. V. (1956). **[Agricultural statistics in the U.S.S.R.]** pp. 239. Moscow : Gosstatizdat. **1256**

A chapter of this book is devoted to the statistics of livestock in the U.S.S.R. The numbers of cattle, pigs, sheep and goats, and horses are given, in tabular form, for the years 1916, 1928, 1941, and 1953. The latest figures are

those for October 1955, when the numbers of livestock were, in millions: cattle 67·1, cows 29·2, pigs 52·2, sheep and goats 125·0.—M.G.G.

STRUK, V. M. (1957). **[Blood proteins and clinical status of pigs maintained in winter in piggeries of the semi-enclosed type.]**—*Trud. Novocherkassk. zootekh.-vet. Inst.* No. 10 pp. 89-97. [In Russian.] **1257**

27 pigs kept in an enclosed piggery, where the temp. in winter ranged from 5° to 21°C., were compared with 25 pigs of the same age kept in a semi-enclosed piggery, where the temp. inside the building varied from −10° to 0°C. (outside temp. ranged from −23° to 9°C.) The experiment started in November, when the pigs were 3 months old, and lasted until June. During January and February the pigs in the semi-enclosed house had a slightly higher body temp. and pulse rate; the proportions of serum albumin and globulins were also higher than in pigs in enclosed houses. It was claimed that such pigs would be more resistant to disease.—R.M.

TECHNIQUE AND APPARATUS

ZUBRZYCKI, L. & SPAULDING, E. H. (1958). **A continuous flow apparatus for the study of mixed cultures.**—*J. Bact.* **75,** 278-282. **1258**

A description of a continuous flow apparatus for comparatively large volumes of culture broth.—T.E.G.R.

WILSON, M. W. (1958). **The agar diffusion precipitin technique: a comparison of the simple and double diffusion methods.**—*J. Immunol.* **81,** 317-330. [Author's summary modified.] **1259**

The potential sensitivity of the double diffusion method is greater than that of the simple diffusion method. The reaction range of the simple diffusion method is unlimited in the antigen excess zone but is restricted to only a narrow segment of the antibody excess zone. The reaction range of the double diffusion method is unlimited in both directions. The effective reaction time, *i.e.*, the time during which a precipitate band persists in the column, is the same for both methods at intermediate or high concentrations of antigen and antibody, but at relatively low concentrations of the reactants the effective reaction time of the simple diffusion method is the shorter. The resolving power of the double diffusion method for mixed precipitin systems is much better than that of the simple diffusion method. The sensitivity of the simple diffusion method to concentration and temperature is much greater than that of the double diffusion method. Under average lab. conditions temperature artefacts in double diffusion columns or plates have never been observed, but special precautions must be taken to prevent such artefacts in simple diffusion columns.

SCHENCK, D. M. & MOSKOWITZ, M. (1958). **Method for isolating single cells and preparation of clones from human bone marrow cultures.**—*Proc. Soc. exp. Biol., N.Y.* **99,** 30-33. [Authors' summary.] **1260**

A simple method for isolating single tissue culture cells has been developed. The cells are isolated on small glass squares which can be transferred to any desired culture vessel or testing apparatus. This procedure has been used for the preparation of clone cultures.

WATSON, D. & PRATT, D. A. H. (1958). **Estimation of blood-urea. A rapid micro method.** — *Lancet* November 22nd, 1088-1089. [Authors' summary modified.] **1261**

This is a simple spot test suitable for as little as one drop of capillary blood, urine, or other body fluid. It uses a suspension of soya-bean meal, a filter paper treated with manganese and silver nitrate, and a hot-air oven. There was good correlation between the values obtained by this method and that of Archer & Robb (1925). Estimations in blood to which varying amounts of urea had been added were satisfactory. The cost in reagents and technicians' time is about a quarter of that of conventional methods.

BOST, J. (1958). Fistule permanent du reticulum chez les petits ruminants (technique nouvelle par voie thoracique). **[Thoracic approach for establishing a fistula of the reticulum in small ruminants.]**—*J. Physiol., Paris* **50,** 170-174. **1262**

Thoracotomy was performed on the left side with resection of the 6th and 7th ribs. The diaphragm was sutured to the opening in the ribs and an incision was made in it. Part of the reticulum was sutured within the incision and also sutured to the overlying skin. A month later the fistula was created by incision through the skin at the point of attachment of the reticulum and a cannula was inserted. Changes in pressure within the reticulum were recorded.—R.M.

HANSSON, C.-H. & OBEL, N. (1958). **A method for recording blood pressure during operation.** —*Nord. VetMed.* **10,** 457-468. [In English.

Summaries in Swedish and German. Authors' summary modified.] **1263**

A fine polythene catheter introduced into an artery is perfused with Ringer's solution at a constant low rate. A side connection leads to a mercury manometer with the smallest possible displacement and with a moveable scale so that the zero position can be corrected for the pressure gradient in the catheter against atmospheric pressure. A platinum resistance wire is placed in the free arm of the manometer and connected as one arm of a Wheatstone bridge. Thus the pressure changes are converted to potential changes which can be recorded by an electronic compensator.

The values obtained are slightly less than the values of systolic blood pressure in the contralateral artery obtained simultaneously by a strain gauge manometer.

Clinical testing has shown the apparatus to be quite reliable even over extended periods (up to five hours).

The compensator can be calibrated to give a blood-pressure curve which can be read from any point in the operating room, even by untrained personnel.

See also abstr. **976-978** (aeration techniques for vaccine production); **1006** (cultivation of leptospires); **1091** (isolation of psittacosis virus).

REPORTS

INDIA. (1957). **Annual report of the Indian Veterinary Research Institute, Izatnagar and Mukteswar, for 1953–1954.** [DATTA, S.] pp. 98. Delhi: Govt. of India press. 5s. 9d. **1264**

RINDERPEST virus, "line E" bovine Strain, which reached 369 serial passages since its isolation from a field outbreak, no longer evoked severe reactions even in highly susceptible hill cattle. The goat-adapted virus, "line W 1", reached 390 passages and was fully immunogenic for cattle when tested after 280 and 302 passages. The lapinized virus, Nakamura strain 111, reached 1,411 passages and was "fixed" with regard to antigenicity and pathogenicity for rabbits as well as other susceptible species. The immunity following vaccinations with this virus in earlier years in farm cattle, buffaloes, sheep and goats lasted for at least 4 years. The freeze-dried lapinized virus was viable after more than 6 months at 10°C., 3 months on ice in thermos, and 8 hours in reconstituted vaccine in container kept on ice. A strain of lapinized virus adapted to goats reached 131 serial passages; and with the advance of passages there was a gradual increase in the titre of virus in the goat spleen. Neither goats nor hill cattle vaccinated with this "goat-reactor" virus showed any reaction, though they proved immune on challenge. The immunity following the FOOT AND MOUTH DISEASE crystal-violet monovalent O vaccine lasted for about 17 months.

The Roumanian strain of SHEEP POX virus was maintained by s/c inoculation in the flank region, and its application by scarification on the inside of the ear flap was safer than intradermal injection.

The Mukteswar strain of egg-adapted NEWCASTLE DISEASE virus reached 320 passages in embryonating eggs and was fully immunogenic even in dilutions of 10^{-7}. The freeze-dried virus stored at 5°C. showed no decrease in titre in 28 months, and it was viable even after 30 days at room temperature. In a fowl which died after artificial infection, the virus remained in high concentration in spleen preserved in phosphate-buffered 50% glycerol at 37°C. for 10 days, but was lost earlier from the liver and brain. A virulent strain of the virus maintained in pigeons showed no appreciable attenuation even after 620 serial passages. Dobson F strain failed to evoke immunity response when injected into the nostrils of 3-day-old chicks.

Borrelia anserina was successfully adapted to the chick embryo, and a formolized vaccine prepared from this material conferred immunity for at least one year. *Corynebacterium renale* was isolated from the urine and kidney of a cow affected with suppurating PYELONEPHRITIS and haematuria.

In carcasses of male g.pigs killed with *Clostridium chauvoei* and kept at room temp. and at 30°C., contamination of heart-blood and muscle with *Cl. septicum* occurred in 24 and 12 hours respectively, and with *Cl. welchii* in 72 and 20 hours respectively. Penicillin was effective in curing BLACKLEG, even when the treatment was delayed until the appearance of clinical symptoms, following artificial infection in cattle, sheep and g.pigs. *Salmonella pullorum* was responsible for heavy mortality in brooder chicks on a farm.

'Q' FEVER was diagnosed in a hill bull on the basis of serological examination and the finding of rickettsia in blood films.

Only young *Indoplanorbis exustus* snails (under one week) were susceptible to experimental infection with *Schistosoma indicum*. This snail was found to be the intermediate host of *Pseudodiscus collinsi*, a common trematode of equines and elephants in India, and also of

Artyfechinostomum sufrartyfex, a trematode parasite of pigs and man.

Some 34 varieties of vaccines, sera and other biological products were prepared in large quantities and supplied to the different States of India and to some extent also to other countries.—R. N. MOHAN.

INDIA. (1957). **Annual report of the Indian Veterinary Research Institute, Izatnagar and Mukteswar, 1954–55.** [SAHAI, L.] pp. 91. Delhi: Govt. of India press. 5s. 9d. **1265**

Observations were recorded on the behaviour of a number of strains of RINDERPEST virus maintained by serial animal passage. The lapinized strain reached 1,525 passages and continued to be fully pathogenic for rabbits and antigenic for other susceptible species. In one Jersey cow and 214 Jersey/ Sindhi crosses vaccinated with this virus there was no appreciable reaction or decrease in milk. The lapinized strain maintained by serial passage in goats gradually lost its pathogenicity for rabbits and, as in a similar case previously, was suddenly lost completely after 125 passages in goats.

The type strains of FOOT AND MOUTH DISEASE virus, O,A and C, obtained from Pirbright in 1946, maintained their distinct antigenicity even after 118, 120 and 98 passages, respectively, in g.pigs at Mukteswar. Of 76 Indian strains typed so far, 44 were O or O variant, 22 A or A variant, 7 C or C variant, and 3 atypical. The Roumanian strain of SHEEP POX virus was further propagated in sheep by s/c passage. The m.i.d. for goats was nearly 10 times that for sheep, and the reaction in the former was also delayed.

The egg-adapted strain of NEWCASTLE DISEASE virus was in higher concentration in the chorio-allantoic membrane than in the embryo and the allanto-amniotic fluid. The freeze-dried chick-embryo vaccine was safe and efficacious for immunizing chicks upwards of 4 weeks of age, but not for younger chicks. The Komarov strain was similar to the Mukteswar strain in pathogenicity for chick embryos and post-vaccination reaction and immunity in 6 to 10-week-old chicks.

Immunity against CAPRINE CONTAGIOUS PLEUROPNEUMONIA following vaccination with attenuated culture lasted for at least 8 months, but not so with the formolized lung vaccine. Further tests conducted during the year showed that the immunity following vaccination with FOWL SPIROCHAETOSIS chick embryo vaccine was "solid" for 15 months.

Pasteurella septica oil adjuvant vaccine conferred immunity for six months in 6 of 7 vaccinated cattle. Comparison of reactions to single and double intradermal tuberculin test in 21,674 cattle so far tested revealed 2 positive and 17 doubtful reactors to the second test among 20,755 negative to the first test; 62 positive, 4 negative and 352 doubtful reactors among 418 doubtful to the first test; and 500 positive and one doubtful reactor among 501 positive to the first test. The vole bacillus failed to protect goats, and to cause cross allergy, against *Mycobact. tuberculosis*. Among the pathogenic bacteria isolated from 163 calves dying within 3 months of birth, *Salmonella* was present in 74 (*S. dublin*, 45; *S. typhi-murium*, 11; *S. enteritidis*, 4; *Escherichia coli* in 52, and *Bact. aerogenes* in 6.) METRITIS and CERVICITIS were detected in 27·15% and 10·52% respectively, of 1,050 genital organs of slaughter buffaloes.

Both short-haired and long-haired goats in the hills and the plains of northern India were infested with *Hypoderma crossii*; observations on the life-history were recorded. A new genus, *Orientobilharzia* was created to include the mammalian species of the genus *Ornithobilharzia*, which was reserved for avian species only.

The copper content was low in straws and hays and cereal grains in several parts of India; and the blood and liver copper values were usually low in calves and in slaughter buffaloes and goats, but not in sheep. The manganese content of paddy straw was usually very high, and the cobalt content generally low. The blood haemoglobin in cattle, buffaloes, sheep and goats on several farms was comparatively low, in some cases despite feeding with mineral mixture containing the trace elements.

—R. N. MOHAN.

BOOK REVIEWS

BRAY, R. S. (1957). **Studies on the exo-erythrocytic cycle in the genus *Plasmodium*.** pp. vii + 192. London: H. K. Lewis & Co. Ltd. 42s. [London School of Hygiene and Tropical Medicine Memoir No. 12.] **1266**

The study of malarial parasites during the past 50 years has presented protozoologists with a series of puzzles and problems. In particular Schaudinn's report that he had seen sporozoites penetrating into red blood cells, obstructed entry into what has proved to be a very profitable field of research. It had long been suspected

that in the vertebrate host some cycle of development existed apart from that occurring in the red blood cells and gradually the details of the complete life history of the Plasmodia have been pieced together. To-day there is sufficient information about exoerythrocytic schizogony for it to be an important aid to classification.

This book tells the story in logical sequence that makes fascinating reading. The author properly begins by defining the terms used for different types of exoerythrocytic forms and gives the history of their discovery in avian and mammalian hosts. Very complete descriptions are then given of the present state of knowledge of the exoerythrocytic cycles in avian, saurian and mammalian plasmodia. Accounts are given of their morphology and physiology based upon chemotherapy, biochemistry and behaviour in tissue cultures.

This is a detailed review and the author speaks from an intimate knowledge of the work carried out at the London School of Hygiene & Tropical Medicine over the last twelve years which is a major contribution in this field. He includes some accounts of his own original research which are not published elsewhere, particularly in the sections on biochemistry and tissue culture. There are also several details given which are supplementary to published work, *e.g.* the nature of the control experiments in the work on *Pl. cynomolgi* and *Pl. inui*.

It is pointed out that plasmodia are of limited importance to domestic animals, although it is noted that *Pl. durae* in turkeys and to a lesser extent, *Pl. juxtanucleare* in chickens, may cause losses. It is strange that in this connexion such a well known species as *Pl. gallinaceum*, which can cause fatal disease in susceptible fowls imported into areas where the local fowls are carriers, should not have been mentioned.—L. P. Joyner.

Beaudette, F. R. [Edited by.] (1958). **Progress in psittacosis research and control.** pp. xii + 271. New Brunswick, New Jersey: Rutgers University Press. **1267**

This book comprises the proceedings of the Second Symposium on Psittacosis held in New York in February, 1956, under the auspices of the New Jersey Agricultural Experiment Station. It is divided into four parts. The 6 papers contained in Part I (Ecologic factors in disease) are of a general nature. Part II (Diagnosis of psittacosis) contains the following: Lesions in turkeys, by Dr. E. Davis & J. P. Delaplane; Comparison of the chick embryo and mouse for isolating the psittacosis agent, by R. Fagan; Complement-fixing antigens from infected yolk sacs, by M. Volkert & P. M. Christiansen; Intradermal test for fowls and turkeys, by A. A. Benedict; Diagnosis of human infection, by I. Gordon.

Part III is concerned with therapy and deals with chemotherapy of psittacosis in parakeets, by K. F. Meyer & others; chlortetracycline therapy in parakeets, by R. H. Bussel & M. Pollard; and chlortetracycline therapy in turkeys, by D. E. Davis & J. P. Delaplane. Part IV (Progress in control) contains papers by J. M. Andrews and M. Pollard.

This book cannot serve as a textbook on psittacosis, but it illustrates current trends in the U.S.A., and will be of interest to medical and veterinary workers concerned with the disease. It is sad to record that F. R. Beaudette, who arranged both symposia and was mainly responsible for their success, died during the the editing of this volume.—R.M.

Euzéby, J. (1958). Diagnostic expérimental des helminthoses animales. Travaux pratiques d'helminthologie vétérinaire. **[Veterinary helminthology; systemics of laboratory diagnosis.]** pp. 367. Paris : Vigot Frères. Fr. 2500. **1268**

Clinical symptoms are of limited value in diagnosing helminth infections in domestic animals and birds. A reliable diagnosis can best be made by demonstrating the presence of the helminth in the host. This usually entails the assistance of a specialist who knows of various means whereby the presence of the parasite can be detected.

Professor Euzéby has collected together many of the methods employed by the specialist in diagnosing helminth infections, which together with numerous keys for the identification of adult worms, eggs and larvae, form the subject of his book. It is intended for use by a "wide public", including veterinary students, and veterinary practitioners wishing to carry out their own detailed diagnosis.

The book starts with a series of keys by means of which the common helminths of domestic animals and birds can be allocated to their different families. It is then divided into three parts.

Part I (in two sections), comprising the greater part of the book, deals with direct diagnosis during life and *post mortem*. The examination of faeces for adult helminths, or more frequently for eggs or larvae, is the commonest means of diagnosing infection in the living

animal. A very full account is given of various methods, both qualitative and quantitative, used for the examination of faeces. The different mammals and birds are considered separately, keys for the identification of the eggs and larvae follow the description of the methods of faecal examination. A very useful account of pseudo-parasites found in faeces is included. The examination of urine, skin and blood, is dealt with in a similar manner. In the second section (diagnosis by P.M. examination) methods used in examining the different organs and tissues in which helminths may be found, together with methods of preparing the parasites for microscopic examination, are described. Each organ or tissue is considered in turn, and separate keys provided for the identification of the helminths found in that particular organ or tissue in the different mammals and birds. Parts II and III deal with "xeno-diagnosis" and "indirect methods of diagnosis" respectively.

Numerous photographs are included with the text. They are not particularly good, however, and it is doubtful whether many, except those of eggs, are sufficiently clear to aid identification. There are also a few line drawings borrowed from various sources. It is a pity that far more simple line drawings, illustrating readily seen diagnostic features, are not included. Such drawings would have made identification of the parasites much easier, and greatly enhanced the value of the book.

The way in which the contents of the book are arranged is to be particularly commended. It should be of interest to anyone concerned with the diagnosis of helminth infections, whose knowledge of the French language is adequate to follow the text.—J. Rose.

Brion, A. (1958). Vade-mecum du vétérinaire. Formulaire vétérinaire de pharmacologie, de thérapeutique et d'hygiène. **[A veterinary vade-mecum. Pharmacology, therapeutics, and hygiene.]** pp. xv+752. Paris: Vigot Frères. 10th revised edit. **1269**

More than half the available space in this new edition deals with the dispensing and administration of drugs and general and special therapy. Other sections deal with poisonous substances, disinfection, serotherapy, immunology, prophylaxis, sanitary measures and legislation in respect of contagious diseases, unsoundness and warranty, hygiene of nutrition, and reproduction, painless destruction of animals, control of rodents, insects, molluscs, etc., and urology. There are many tables and an adequate index. This useful, handy pocket book is very well produced.—E.G.

Sykes, G. (1958). **Disinfection and sterilization.** pp. xviii+396. London: E. & F. N. Spon Ltd. 75s. **1270**

An analytical review of progress in disinfection and sterilization during the last two or three decades and a discussion largely of the chemical and physical aspects.

This work is in six parts of which the first deals with the theory of disinfection and mode of action of disinfectants. The second part is concerned with methods of sterilization — by heat, radiation, filtration, gases, vapours, cold desiccation and cellular disintegration. In Part III air disinfection and sterilization are fully discussed and Part IV is a brief interesting treatise on the disinfection of viruses. Chemical disinfectants form the subject matter of Part V and the concluding part deals with preservation and preservatives. Each section is followed by an extensive list of references and there are complete author and subject indexes. This book, which is very well written and presented, should be of value to those whose activities take them into the fields of bacteriology, medicine and chemical engineering.—T.E.G.R.

Nalbandov, A. V. (1958). **Reproductive physiology. Comparative reproductive physiology of domestic animals, laboratory animals and man.** pp. xi+271. San Francisco: W. H. Freeman & Co. $6.75. (London: Bailey Bros. & Swinfen Ltd.) **1271**

This book was written primarily for students taking courses of various types, mainly with an agricultural bias but including medicine and domestic science. In his preface Nalbandov stresses the importance of the comparative aspect, and the dangers of over-specialization. He writes avowedly as an endocrinologist, and declares his intention of using "whatever good data there are". The mistake of talking down to the young student is avoided and the treatment of each aspect is such as to merit perusal by specialist workers. Much purposeful thought has obviously gone to the presentation of endocrinological problems, for instance in chapters 3 and 6, and these sections are excellent preparatory reading for young workers in hormone research. It is good to see emphasis placed on the need for keeping adequate untreated controls in clinical trials, and on the detrimental effects which may be expected by breeding from stock with a tendency to functional infertility. There is an excellent account of cystic ovaries in pigs, and the European and American post-mortem findings on incidence of congenital oviduct abnormalities are interestingly contrasted, (though László's work is not mentioned). An-

other good chapter is Chapter X dealing with efficiency of reproduction.

It must, however, be stated that despite Nalbandov's acknowledgment of the evils of over-specialization, his text provides abundant evidence that his expert knowledge is largely restricted to the physiology of the pig and sheep; he appears to be relatively ignorant of our most important domestic animal, the cow, not only as regards certain important non-endocrine aspects of its physiology, but also on its progesterone metabolism and the endocrinology of cystic ovarian disease and there are many false statements in the text. Nalbandov states that old corpora lutea are called corpora albicantia and are no longer visible by the third cycle after that in which they were functional. In actual fact the persistence of the red remnants of dioestrous corpora lutea, usually for 10–12 cycles, was well recognized some 40 years ago, and was discussed by Hammond; Wright clearly differentiated between these remnants and the actual corpora albicantia which are remnants of *pregnancy* corpora and which persist always for four years and often for life (Dawson). The lifetime persistence in the whale is dismissed as an 'interesting exception''.

One cannot agree that histological differentiation of cyclic phases in the endometrium of the cow is so difficult; the phase changes have been clearly described by at least 12 teams of workers, and the histochemical changes are particularly striking. Nalbandov states that there is a cyclic sloughing (in the late luteal phase) and regeneration of the surface epithelium. Tagliavini certainly described such sloughing, but few subsequent workers seem to have observed this, although Weber *et al.* observed a sloughing, in heifers only, immediately after heat. It is claimed, without evidence, that post-oestrous bleeding is not an oestrogen-withdrawal phenomenon (as was maintained by Hansel & Asdell). Regarding ''repeat breeding'' in cows, Nalbandov states that there are no known reasons for its occurrence, ''probably a defect in the eggs themselves''. In some cases this no doubt applies, but he takes no cognizance of the (probably overwhelming) important role played by endometritis and endosalpingitis in producing tissue damage apparent only on histological examination.

Nalbandov considers results with progesterone in improving bovine reproduction as ''not promising'', whereas among others Herrick and Johnson both record considerable improvement. Significant contrary work is not known to the reviewer. Short showed that the cow secreted no placental progesterone, thus invalidating the remark ''recent work has shown that the androgen excreted by pregnant cows may be a conversion product of placental progesterone''. Exception must be taken to the assertion that ''recent work'' (whose, not stated) ''has shown ovarian cysts in cattle contain no oestrogen''. This may refer to a very small scale experiment by Berthelon, but Lesbouyries, Yamauchi and Paredis have each demonstrated very considerable oestrogen in such cysts; indirect evidence also confirms these findings. Nalbandov proceeds then to discuss cystic disease in terms purely of *virilism*, a condition which has been shown, most clearly by Garm and also by Lesbouyries, Kock & Berger, Bareggi, Vandeplassche, Eriksson, to comprise only from 5–20% of the cases, and this despite the inclusion of Garm's paper in the reference list. The discussion is like one of Hamlet without the Prince of Denmark! Nalbandov states that Garm observed *hypotrophy* of the adrenal glands and that urinary ketosteroids increase significantly in nymphomania cases. Actually Garm observed adrenal *hypertrophy* in both types of the disease and recorded a drop of urinary ketosteroids to less than half the normal in nymphomania cases.

Discussing the role of sex hormones in uterine infection, the importance of rhythmical *alternation of phase* in securing a sterile uterus is not appreciated by Nalbandov. The results demonstrating heavy infection under the influence of oestrogen (Weinstein, Gardner & Allen, Burrows & Kenneway, Blakemore, and Terpstra) are not mentioned.

In addition to these errors there are a number of careless slips, spelling mistakes such as ''heads'' for ''beads'', and those in proper nouns such as Foley (Folley) and Danzier (Dauzier), and more misleading mistakes. Thus the differences between the platypus ovaries and those of *Ornithorhynchus* (its own Latin name) are detailed, and it would be interesting to know the other breed differences between Holsteins which have 8·84% twin pregnancies and Friesians which have 3·35%! Remarks on erythroblastosis foetalis in non-primates seem to do less than justice to the work which has been done in pigs and horses and the conclusion that mechanical sex control attempts have all revealed dead ends accords similar treatment to Lindahl's very promising results from centrifugation.—F. L. M. Dawson.

Baier, W. & Schaetz, F. (1958). Tierärztliche Geburtskunde. **[Veterinary obstetrics.]** pp. viii + 316. Stuttgart: Ferdinand Enke. 3rd edit. DM 49. **1272**

This book first appeared under the name of A. O. Stoss in 1928 (2nd edition 1944). The extensive revision done by Prof. Baier of Munich and Prof. Schaetz of Berlin has virtually made a new book of this third edition. The authors have aimed at a concise yet complete presentation of contemporary concepts and methods, and economy of space has been achieved by omitting matter now considered to be obsolete. All domestic animals are dealt with, but particular attention is paid to the cow. The book is eminently suitable for students.—R.M.

SCOTT, J. P. (1958). **Animal behaviour.** pp. xi + 281. Chicago: University Press. (London: Cambridge University Press.) 37s. 6d. **1273**

The author explains difficult terms, gives many concrete illustrations derived from species ranging from protozoa to birds and mammals, including some domestic ones, and provides an extensive bibliography with (in many cases) a short annotation; there is a minimum of theory and the outcome is a very interesting book covering a wide field. He stresses the need to take into account the animal's sensory and motor capacities and its habits within its natural environment, including its social organization, all of which vary from species to species, *e.g.* the octopus shows up well in experiments where its well developed eyes are brought into operation; the guinea-pig in many situations appears to have small learning powers but it can make good use of its highly sensitive ears; the howling monkey differs in social organization from the baboon.

His central theme is that behaviour consists of the responses to stimuli arising either from within the animal body or from the environment, which responses vary with the physiological state, *e.g.* the responses of the broody hen differ from those of the laying one; or according to previous experience, *e.g.* the handled puppy's responses differ from those of the unhandled, and the behaviour, at first mating, of a bitch reared in isolation may differ from that of one reared with its fellows. He also illustrates the differing territorial requirements of different species; the effects of overcrowding and undercrowding; the genesis of leadership in sheep and goats; peck order; imprinting; intelligence; behaviour and heredity, *e.g.* the varied behaviour of different breeds of dogs, a subject treated at considerable length.

Errors in detail have crept in, *e.g.* on p. 34 it is stated that cats use their vibrissae "to feel out objects in the dark"; on p. 176, under heading of "mutual care", it is stated that "Even horses will stand head to tail and whisk flies out of each other's faces"; a most unlikely interpretation and one certainly not proven.

—A. BROWNLEE.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review]

BRAZIER, M. A. B. (Edited by) (1959). **The central nervous system and behaviour. Transactions of the First Conference, February 23, 24, 25, and 26, 1958.** [Sponsored by the Josiah Macy, Jr. Foundation.] pp. 450. New York: Josiah Macy, Jr. Foundation. $5.25.

GEBAUER, O. (1958). Die Dasselfliegen des Rindes und ihre Bekämpfung. [**Warble flies of cattle and their control.**] pp. 97. Jena: Gustav Fischer Verlag. [Parasitologische Schriftenreihe Heft 9.] DM 10.20.

GRASHUIS, J. & VAN VLIET, N. (1958). Doelmatige varkensvoeding. [**Correct pig feeding.**] pp. 266. Zelhem: Drukkerij Rommelink. 3rd edit. fl. 5.

HARRISON, R. G. (Edited by) (1958). **Studies on fertility. Including papers read at the Conference of the Society for the Study of Fertility, London, 1958. (Being Vol. 10 of the Proceedings of the Society.)** pp. x + 176. Oxford: Blackwell Scientific Publications. 25s.

MOZLEY, A. (1959). **Ecological processes.** pp. xi + 68. London: H. K. Lewis & Co. Ltd. 9s.

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